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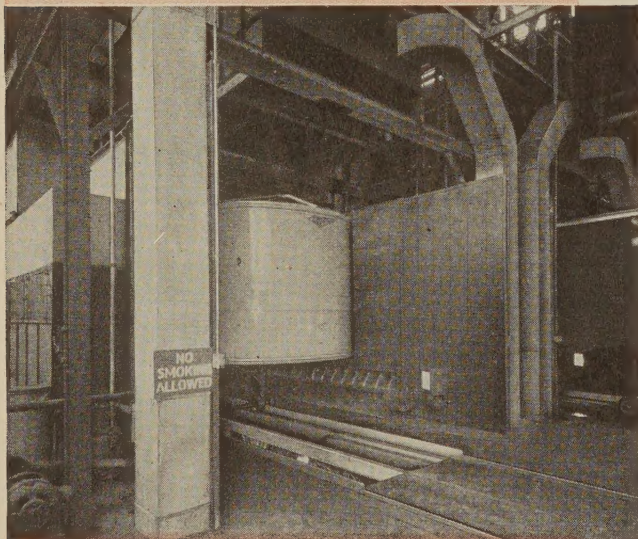
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The Real Danger

BUSINESS is now approximately ten per cent below the peak post-war level reached last November. With declining steel operations, lower power consumption, reduced freight traffic, falling department store sales, it is certain to go lower. Liquidation of bank loans, a weak stock market, and sharply reduced new orders in almost every line of business indicate that this may be more than a seasonal adjustment in business.

A major reverse in our economy is always a serious matter to management, labor and stockholder. Whatever automatic self-cure or purging a business decline brings in its wake, the treatment, however salutary, is rarely welcome. Neither business nor labor nor government would deliberately provoke a depression in order to realize any of its apparent virtues. Economic therapy via business decline is too painful—and too dangerous—to ever become a matter of deliberate contrivance by any group within or without the government.

There are exceptions to this statement. They are exceptions not to be found in the panelled board rooms of Wall Street or the executive committees of big business. They are to be found among groups who see in business weakness an opportunity for a shift in power from its present situs to themselves.

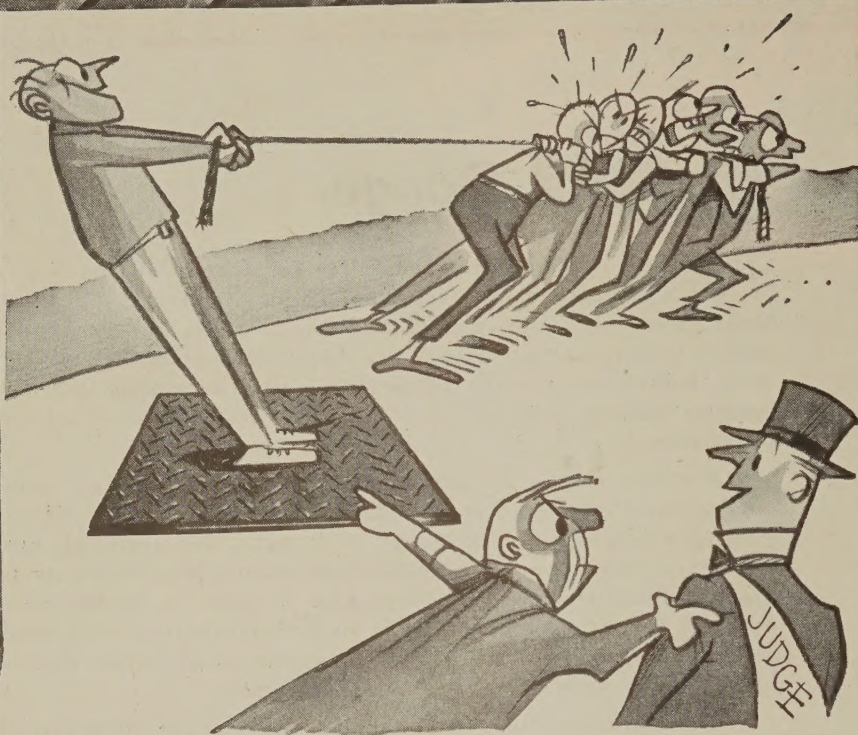
This is true of Communists, of Socialists, and all those liberals of lesser aspiration who believe they can parlay unemployment, declining income, lower stock prices into a shift in power which will benefit themselves. The present trial of the eleven Communists in New York has emphasized those occasions which, the Communists believe, will give them an opportunity to seize power. In their master plan their goal of violent overthrow of present power centers must be realized either during a depression or during war.

It may be recalled that during the recent test of arms with Hitler, Tojo and Mussolini, we were the guilty aggressors, according to the Communists, until Hitler launched his armored columns against the flat-footed legions of the Kremlin. Only then did it become a war in justifiable self-defense. Until June 21, 1941 our domestic Reds were busy pouring sand in our bearings, undermining our unity with mendacious propaganda, ready to slit our throats the moment we lowered our guard. For this was one of the classic opportunities for a successful shift of power according to the Red book.

As a nation we are now entering another period which, according to Marxian instructions, sets the stage for a successful "rise of the proletariat." We may expect the Reds and their stupid dupes to ring all the changes on the time-worn charges. "Capitalism is doomed to inevitable failure. It contains the seeds of its own destruction. There can be no cure except the violent surgery of revolution on the Moscow pattern."

In this chorus of despair many of our own nitwit liberals will join because they hope to achieve lesser if similar changes in power. It behooves the American, therefore, to keep a level head, to distinguish between honest self-analysis and that sabotage of the mind and spirit which may induce us as a nation to take the false highway toward a Socialist paradise. It is a choice which, once taken, can never be reversed.

Joseph Stagg Lawrence



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June 14, 1949

- Steel company raw materials men don't know how long their coal stockpile will last in the unlikely event of a long coal strike. A reserve stock good on Apr. 1 for 50 days operations and unused for 2 months was good for 60 days on June 1. Every time ingot operations drop stocks are stretched.
- Cupola light-off smoke has been practically eliminated in several Chicago plants by use of an electric coke lighter. It is comparatively inexpensive and simple to operate. It is also said to give a better bed and to improve the life of patches. No wood or combustion material other than coke breeze is required. Lighter is essentially an electric torch and takes 15 sec to ignite the coke breeze.
- A recent hurdle encountered by household appliance salesmen is television. Many prospective customers are giving priority to the purchase of TV sets although they need and want appliances. TV sets cost more than most appliances and the average buyer can't purchase both items at once.
- Checking of wall thickness of engine blocks by use of ultrasonic testing equipment holds promise of providing a quick and accurate non-destructive method of locating core shifts. Critical wall thickness of a cylinder wall can be checked in 10 sec with an accuracy of 2 pct.
- Although stainless steel conveyer belts are widely used in plastic and chemical plants and bakery ovens, a new candidate for this job is a high tensile low alloy steel which sells for about a fifth the price of stainless. Two such belts have just been installed in bake ovens on an experimental basis.
- The GM high compression engine program is going forward as rapidly as fuel developments and tool requirements will permit. It appears that a V-6 high compression engine will come next. Such an engine is now being tested at the proving grounds. Although high compression features are getting more attention, many engineers believe friction reduction through greater stiffness in crankshaft and other parts is equally important.
- Now that the pace of production is slackening, steel companies are putting more weight behind new product development. Some are planning to make steels which their competitors have found successful. Also several improvements in steel metallurgy have recently been announced. More are anticipated. Steel is also moving into fields once dominated by wood, rubber, plastics, etc. Effect of these new products and new lines on steelmaking operations will be gradual rather than startling.
- A new process to supplement natural gas supplies to users at times of abnormal peak demands has been developed. "Autothermic cracking" of propane, naphtha, gasoline or other hydrocarbons, plus hot mixing with air, produces a gas said to be suitable for many uses and capable of a wide range of heat values. Such auxiliary units are connected directly to usual supply lines and can be metered in at will.
- Facilities will soon be available to cast commercially pure titanium ingots as heavy as 200 lb. Up to the present time the largest ingots cast have weighed no more than 100 lb. Investigation of the metal's joining qualities indicates that it may be welded to itself readily by fusion or shielded arc. Brazing and soldering techniques are still under investigation.
- One titanium producer is planning to publish a catalog of prices in the next few months listing such semifinished forms as sheet, strip, barshapes, rounds and squares. Welded tubing may be offered later.
- Mills are shortening rolling time for steel items to insure better delivery promises and secure more orders. A close check reveals these approximate delivery times in the Midwest, provided mills have the products scheduled: Carbon bars, 3 to 4 weeks; cold-finished bars, from stock on most carbon grades; special carbon grades, 4 weeks; alloy, from stock, or 4 weeks if it requires will order for rods; cold-rolled sheet, 3 to 4 weeks; hot-rolled sheet, 4 weeks; plates, 4 to 5 weeks; bar size angles and channels, 4 weeks; all shapes 3 to 4 weeks; large wide flange beams, 6 to 8 weeks, with mills anxious for such business; cold-rolled strip, 4 weeks; hot-rolled strip, 5 weeks.
- Mills promise to roll and ship within 3 weeks nearly all other items except some pipe sizes. One large mill has taken all large structurals officially off quota. Thus, the only major delay on delivery of steel items is the mill rolling schedules.

Plating Waste

Improvement of plating waste disposal practice, to avoid stream pollution and sewage system damage, has become one of the major problems of the electro-plating industry. As with industrial smoke control, more and more attention is being focused on industry practice. In this article the author reviews the techniques of treating the various waste solutions, touches upon the economics involved and gives detailed information on the disposal plant at the Willow Run plant of Kaiser-Frazer Corporation.

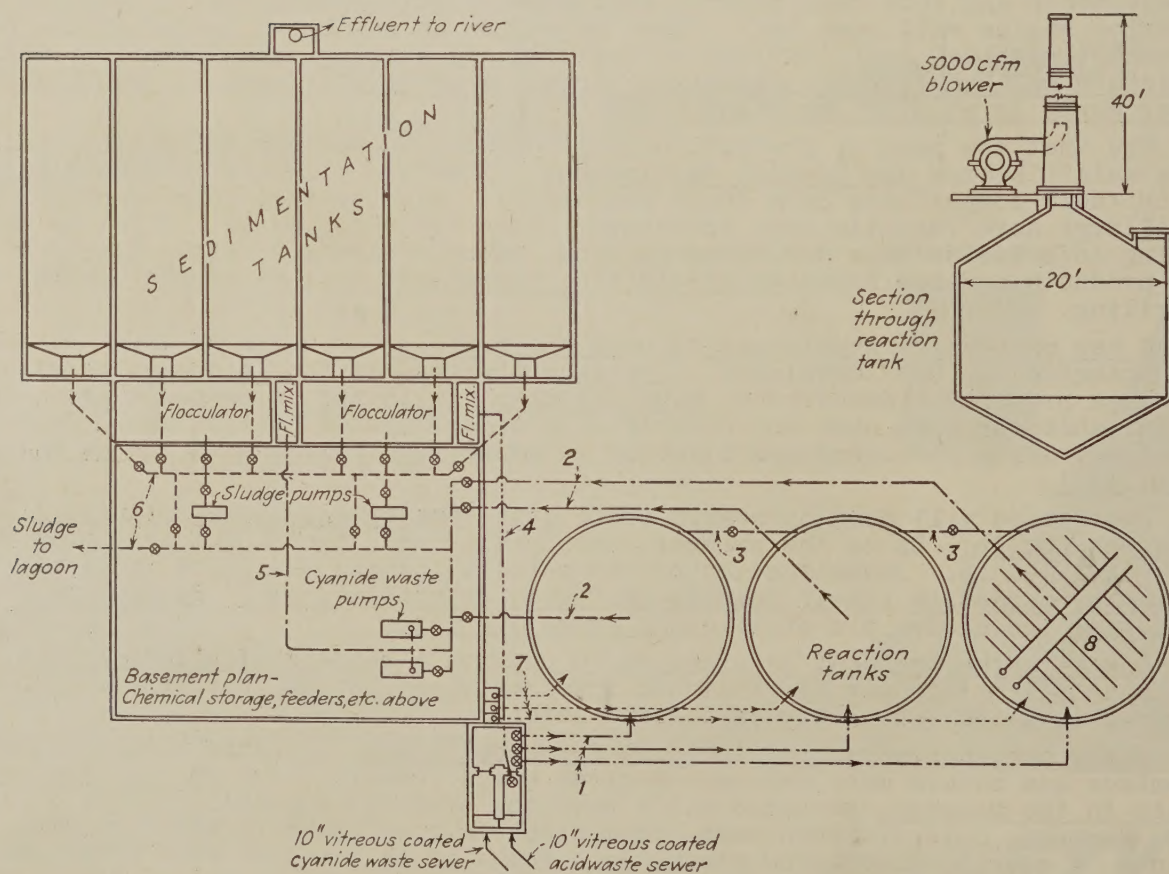


FIG. 1—Diagrammatic layout of treatment plant for plating wastes at Kaiser-Frazer Corp., Willow Run. Piping key: (1) 6-in. discharge lines to reaction tanks; (2) suction lines to cyanide waste pumps; (3) reaction tank equalizing piping; (4) 10-in. C.I. direct discharge to No. 1 flash mixer; (5) cyanide waste pump discharge to No. 2 flash mixer; (6) sludge piping; (7) 1½-in. H₂SO₄ feed lines to reaction tanks; (8) Duriron air distribution in all reaction tanks.

Disposal . . .

By JEROME L. BLEIWEIS

Consultant,
New York

DISPOSAL of plating wastes has become an acute problem. In many states and communities, legislation enforcement¹ is becoming more vigorous. There are also indications that the federal government will enter into the picture, since waterways pollution is an interstate matter and natural resources are affected.

Stream pollution, impairment of sewage system efficiency and damage to sewage disposal mechanisms—all the results of improper disposal—are to be avoided.

Very generally, the following waste conditions² must be established prior to discharge into waterways or sewage systems:

(1) Acids and alkalies should be neutralized to a pH of 5.8 to 8.2.

(2) Cyanides should be reduced to a concentration of 1 ppm or less.

(3) Receiving waterways should be kept free from unnatural coloring by removal of the responsible ions.

(4) Sludges and materials in suspension should be removed.

(5) Concentrations of all constituents should be reduced so that toxic levels will never be reached in receiving waterways. This may involve low, controlled rates of discharge.

For the general plating installation, the approach to the problem involves, first, the institution of methods whereby the concentration of toxic substances going down the drain will be held to a minimum, and, secondly, the incorporation of a suitable waste disposal plant.

In the large plating shop it is not logical to dump spent or contaminated solutions down the drain. Often the solutions can be stored and sold to a refining company. Where this is possible the salvage value may result in marked savings.

Another market for chromic acid wastes, in spoiled solutions or in dragout tanks, is the

leather tanning industry. This has proved a worthwhile outlet for many plating shops. Or, the chromium can be reclaimed inexpensively by reducing the hexavalent chromium with SO_2 , precipitating $\text{Cr}(\text{OH})_3$ with NaOH or Na_2CO_3 , filtering, drying and roasting at 930°F to produce commercial chrome green pigment.

In all cases it is most economical to hold the amount of liquid treated to a minimum. For instance, dilute rinse waters, running continuously, need not and should not be treated. Rather, disposal plant capacity should be reserved for concentrated solutions.

Waste liquors can often be disposed of directly, without resorting to waste disposal plants or to the dangerous practice of discharging the liquors directly, by:

(1) Neutralizing strong acids and alkalies by allowing the waste acids and alkalies to interact in holding tanks. Mechanical agitation and discharge of the near-neutral solutions at controlled rates to the sewer is necessary.

(2) Pumping the solutions to an impounding area where the wastes slowly seep into the earth. These areas must be chosen carefully, taking into consideration the existence of wells or underground streams leading into main waterways.

(3) The use of subsurface irrigation in much the same manner as impounding.

Harmful constituents of the common plating baths are shown in table I². Waste disposal plants for treatment of these materials have a three-fold function: (1) Water soluble constituents which are harmful must be removed; (2) sludges must be disposed, and (3) the diluted solutions must be passed off at a controlled rate according to constituent concentration.

In general, the disposal plant must handle (1) acid wastes, (2) chromic acid and chromate

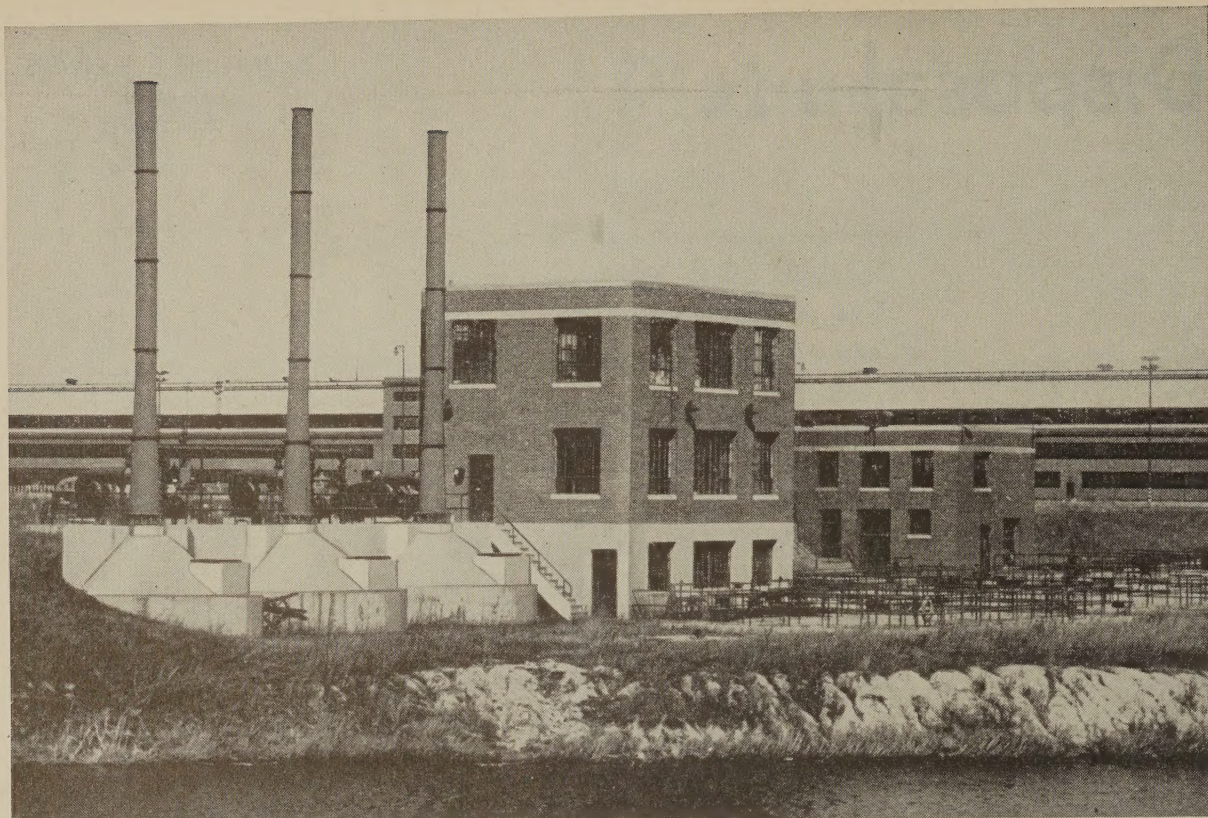


FIG. 2—View of waste treatment plant showing the three reaction tanks, the sedimentation tanks (off to the right from the building basement) and the central building in which chemicals are stored and sludge and cyanide waste pumps and other equipment is housed.

wastes, (3) cyanide wastes and (4) metallic salt wastes.

Treatment of Acid Wastes

Acid solutions, particularly pickling liquor, cannot be safely admitted to sewage systems,* as steel and concrete ducts and structures disintegrate through solution by the acid, sludge is compacted, trickling filters are clogged, reactions in

*An interesting system for pickle liquor treatment and disposal was described in "Regeneration System for Pickle Liquor" by E. D. Martin, *THE IRON AGE*, Sept., 30, 1948.—Ed.

the activated sludge system are disturbed, air diffuser clogging is accelerated and stream pollution may result^{3, 4, 5, 6, 7, 8}.

Acid removal from the waste solutions involves essentially the neutralization of the acid by reaction with scrap steel or with lime.

Where scrap steel is used, the liquors are allowed to react for several days with the steel to exhaust the free acid. This is followed by evaporation of the water and drying to commercial ferrous sulfate (copperas).

Lime neutralization involves reaction of the free acid with lime, followed by aeration and sedimentation to complete the reaction and remove iron oxides and salts.

Removal of Chromate Wastes

Usual treatment for chromic acid and chromate wastes are (1) reduction of hexavalent chromium

to trivalent chromium, followed by precipitation with lime or milk of lime and (2) precipitation, to form insoluble salts of chromic acid.

A third method, sometimes used where the quantities involved are small, is removal through absorption in ion exchangers. A drawback of this method is that the exchange resins are readily poisoned and can be regenerated only by complicated procedures.

In the first treatment mentioned, reduction of the hexavalent chromium can be effected by reaction with steel scrap or with aqueous solutions of FeSO_4 . The scrap steel method is applicable where chromium is present in concentrations of less than 500 ppm. The pH of the waste water must be lower than 3.0 or reduction will take place too slowly. The method, therefore, is particularly applicable where the chromate bearing waste waters are or can be mixed with acid wastes.

A typical scrap steel type installation would consist of a rectangular steel tank constructed of or lined with acid resistant material and provided with removable wooden grids supported horizontally about 6 in. from the tank bottom. This false bottom provides a space for the reception of rust and insoluble matter. Space above the grids is packed with scrap in the form of turnings or baled wire. Volume of the tank should be large enough to allow 4-hr treatment before discharge, and the tank should be provided with baffles to prevent solution short-circuiting. Scrap steel must be added occasionally to replace the steel lost in the reaction.

The ferrous sulfate reduction method is applicable to either acidified or alkaline wastes, and is advantageous in that reduction is both quantitative and rapid. To assure speed of reaction, the stoichiometric amount of ferrous sulfate should be calculated and then twice that amount added. An installation of this type should have two batch tanks of acid resistant material, the tanks to be used on alternate days. Agitation is necessary, either by compressed air or mechanical means. After 1 hr, the effluent is flowed to the lime reactors where neutralization takes place, precipitating chromium and other heavy metal hydroxides. The process can be used as a fill-and-draw operation or as a continuous process.

Another method utilizes the reduction of chromates by BaS followed by precipitation with lime and dewatering by impounding on sand beds. After cyanides have been volatilized, a typical treatment batch would use 4 lb of BaS and 2 lb of CaO for each 1000 gal of solution in which chromium concentration is 100 ppm.

Precipitation methods involve the reaction between BaCl_2 and chromate-bearing waste water to form insoluble BaCrO_4 . BaCO_3 suspended in the waste water can also be used. The BaCO_3 will slowly dissolve and form precipitates of BaCrO_4 and BaSO_4 , where H_2SO_4 is also present. This reaction requires 1 hr for completion and 12 hr for settling. The treatment is handled in

large tanks and, after settling, the supernatant liquid is discharged through a sump and the sludge is handled separately.

Cyanide Removal

Removal of cyanide is very important. Effluent entering the stream should not have a cyanide content in excess of 1 ppm². Since the average plating rinse contains about 100 ppm and a typical plating solution to be discarded contains about 15,000 ppm, the magnitude of the disposal problem can be recognized.

A variety of treatments are used. Ponding, whereby the cyanide is destroyed by oxidation, hydrolysis or decomposition, is used. Acid methods, involving the reaction of H_2SO_4 with the cyanide-bearing wastes and dissipation into the air of the volatile HCN which is formed, are common. FeSO_4 treatment to form less toxic ferrocyanides, treatment with lime-sulfur to produce thiocyanates,¹⁰ chlorine additions for the decomposition of cyanide, oxidation with KMnO_4 to form cyanates and a sludge of MnOH and CaCO_3 , and a recently-introduced alkaline chlorination treatment⁹ are also used.

The most widely used method at present is the acid neutralization technique. In this method, the waste solution is discharged to a reaction tank which is tightly-sealed and rubber-lined or otherwise corrosion protected. The reactor is

FIG. 3—Closeup of the 20-ft diam reaction tanks. The blowers used for aerating the HCN have a 5000 cfm capacity.

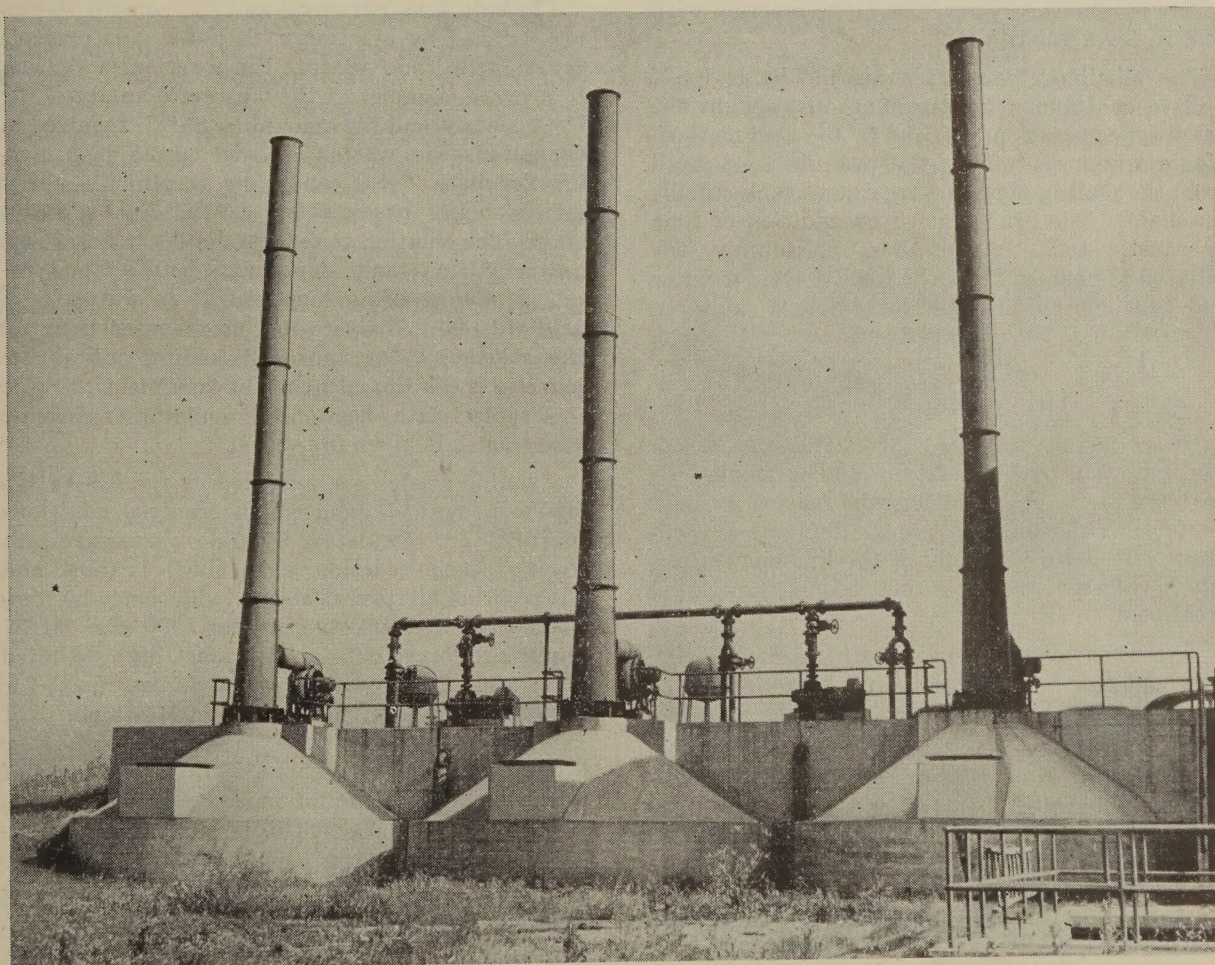


TABLE I

Harmful Constituents in Common Plating Solutions

Process	Harmful Constituents
Chromium.....	H ₂ CrO ₄ and H ₂ SO ₄
Zinc Plating.....	Zn(CN) ₂ and NaCN
Copper Plating.....	Cu(CN) ₂ and NaCN
Anodizing.....	H ₂ CrO ₄ and H ₂ SO ₄
Bonderizing.....	H ₂ CrO ₄
Dips.....	NaCN, HNO ₃ , HCl, H ₂ SO ₄
Cleaners.....	NaOH

equipped with an air blower and ventilating stacks. H₂SO₄ is added and the contents are agitated by compressed air. Cyanide is volatilized as HCN and vented through the high stacks, aeration continuing for about 16 hr. Typical of such installations is the one employed by Kaiser-Frazer at Willow Run, Mich., shown in figs. 1, 2 and 3, or the installation at the Chevrolet plant at Flint. The latter has a 5000-gal tank with a 60-ft ventilating stack. A typical treatment involves 4500 gal of waste liquid containing 2.8 oz of CuCN and 1.1 oz of free cyanide per gal. This is reacted with 4255 lb of 66° BeH₂SO₄. After treatment, the cyanide concentration is reduced to less than 1 ppm.

The lime sulfur method involves reaction of calcium polysulfide with the waste water (1.84 lb of solid lime sulfur per lb of NaCN present). The reaction time is 2 hr at room temperature or ½ hr at boiling point. Before discharge, the sulfide is removed by aeration or by reaction with acid to form volatile H₂S.

The alkaline chlorination method lends itself well to continuous treatment as opposed to the batch type operation required by the acid method. Waste water containing the cyanide is pumped from the plating floor to a treatment tank outside the plant. The pH is raised by addition of lime or caustic soda. After thorough mixing, the solution is pumped from the tank to a chlorinator and through an injector for chlorine addition. The solution is then pumped back and discharged.

Heavy Metal Removal

Heavy metals, such as copper, zinc and nickel, are removed by flocculation and precipitation with the aid of chemical coagulants such as alum or ferric chloride plus lime. Removal is generally effected during any of the lime neutralization processes and does not require a special treatment.

The removal processes are coupled with suitable sludge removal stages in which the sludge is ponded or dried and sold.

A typical disposal plant is the one handling the wastes of the Kaiser-Frazer Corp. plant at Willow Run, shown in figs. 1, 2 and 3. Until a little over a year ago, this plant was operated by the corporation;¹¹ however, along with all such plants at Willow Run, it has been taken over by the Ypsilanti Township authorities who are now operating the plant.

Wastes, including NaCN, H₂CrO₄, dichromates, HCl, HNO₃ and ZnSO₄, in daily volumes of about 300,000 gal are handled.

A diagram of the plant is shown in fig. 1. It consists of two flash mixers; lime, FeSO₄ and H₂SO₄ feeding equipment; two flocculators; six sedimentation tanks each having a capacity of 14,600 gal and equipped with mechanical sludge collectors; three reaction tanks each with a capacity of 27,000 gal, sealed and lined with acid resistant materials and equipped with aeration piping and blowers which exhaust HCN through 40-ft stacks; and accessory equipment such as air compressors, pumps, etc.

Two lines bring the acid and cyanide wastes separately to the treatment plant. This dual system prevents the cyanides and acids from interacting in the piping system to form the poisonous HCN.

When the plating department is going to dump any solution, the treatment plant is notified of the time, quantity and type of solution so that proper routing and treatment can be carried out. In the case of acid wastes, the solution is routed to a flash mixing chamber where lime is added. The solution is then moved to the flocculators for precipitation of CaSO₄ and then to the settling basins where moving sludge collectors gather the sediment and pump it to a lagoon about a mile from the plant. The quantity of lime required is determined by analyzing the wastes first for total acidity.

Chromic acid, chromate and dichromate wastes are handled by reaction with FeSO₄ and precipitation with lime. Before the reaction is allowed to proceed, samples of the waste are analyzed for CrO₃ content and the amount of FeSO₄ required is computed. The wastes are sent to the flash mixers for both FeSO₄ and lime treatment, heavy metals being precipitated at the lime-addition stage. The solution is sent to the flocculators and sedimentation tanks for sludge settling and removal, sludge being lagooned as in the case of acid wastes. Analyses are made every hour on the solution going into and coming out of the plant to check the adequacy of treatment.

A typical data sheet on the dumping of chromic acid wastes is given in table II¹².

Cyanide wastes are analyzed by the KI-AgNO₃ titration method from which required additions of H₂SO₄ are calculated. Cyanide wastes are sent directly to the reaction tanks, H₂SO₄ is added and the reaction mixture is aerated vigorously by compressed air fed into the tank at 5000 cfm. HCN fumes are forced out the 40-ft stack highly diluted with air. The aeration period is continued for 6 to 10 hr. Approximately 14 lb of H₂SO₄ per lb of cyanide is added to reduce the pH to about 3, after which aeration is initiated. If, after removal of the cyanides, the liquid in the reaction tank is highly acidic, it is sent through the lime neutralization cycle.

The plant handles about 600,000 gal a month of cyanide wastes collected in batches from the plating room. Concentration of cyanide averages

about 75 ppm, the solutions being at a pH of near 10. Rinse waters usually show cyanide concentrations of about 2 ppm. After treatment, the effluent contains about 1 ppm and has a pH of about 7.5.

Acknowledgment

The author thanks N. Herda, utilities superintendent, Water and Sewage Dept., Ypsilanti Township, for permission to use photographs and data in this article.

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¹ C. J. Lewis, "Disposing of Plating Room Waste Liquors in Compliance with Stream Pollution Laws," Proc. Amer. Electroplaters' Soc., 1946.
² L. F. Oeming, "Stream Pollution Problems in the Electroplating Industry," Monthly Review, Amer. Electroplaters' Soc., 33, 668, 1946.
³ J. Grindley, "Treatment and Disposal of Waste Waters Containing Chromate," J. Soc. Chem. Ind., 64, 339, 1945.
⁴ H. E. Monk, J. Inst. Sewage Purification, Part I, 1939.
⁵ S. H. Jenkins and C. H. Hewitt, Jr., Inst. Sewage Purification, p. 222, 1942.
⁶ G. E. Barkes and M. M. Braidech, Eng. News Record, pp. 129, 496, 1942.
⁷ B. G. Anderson, Sewage Works Journal, 16, 1156, 1944.

TABLE II		
Treatment Data on a Typical Batch of Chromic Acid Wastes at Kaiser-Frazer Corp., Willow Run		
	Reaction Tank 1	Reaction Tank 2
Quantity of Waste (gal).....	27,415	25,847
pH.....	2.8	2.7
CrO ₃ Content (ppm).....	473	470
(lb).....	108	107.5
FeSO ₄ Required (lb).....	907	903
FeSO ₄ Dosage (lb per hr).....	413	437
H ₂ SO ₄ Content (ppm).....	1372	1294
(lb).....	314	296
Lime Required (lb).....	454	452
Lime Dosage (lb per hr).....	207	218

Effluent after treatment had chromic acid content of 5 ppm and pH of 8.

⁸ C. L. Siebert, "The Treatment of Waste Water from the Steel Industry," Iron & Steel Eng., 23, 7, 1946.
⁹ U. S. Pat. 2,194,438, assigned to E. I. du Pont de Nemours & Co.
¹⁰ J. G. Dobson, "Disposal of Cyanide Wastes," Metal Finishing, 45, 2 & 3, 1947.
¹¹ N. Herda, "Treatment of Cyanide and Acid Plating Wastes," Sewage Works Journal, 18, 499, 1946.

Broaching Steering Knuckles

THE problem of broaching two well separated bores accurately in line in forged steel steering knuckles was recently solved by a large automobile manufacturer working with the Colonial Broach Co., Detroit. An unusual setup on a 15 ton, 48 in.-stroke Colonial pull-down machine is used. Two parts are handled at one time. A shutting platen, hydraulically interlocked with the machine cycle, and an automatic locking and tilting fixture permit the operator to unload and load parts while broaches are being returned to the cutting position, thus eliminating machine idle time usually required for these operations.

The fixture and broaches are shown in loading position in fig. 1. The rough-bored knuckle, fig. 2B, is dropped into the fixture, spindle down, the parts being located from the spindles and buttons on the lugs of the yoke. When the

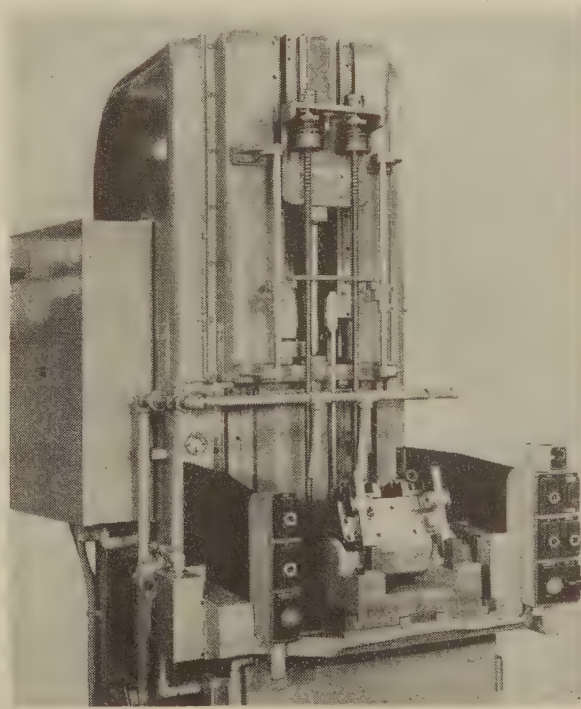
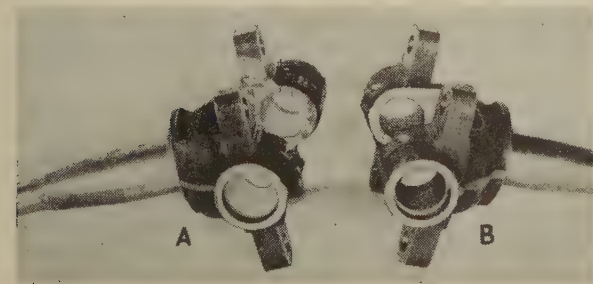
start-button is pushed, the trunnion fixture swings down and the platen shuttles into broaching position. As the broaches start down to enter the bores, a rod between the broaches actuates a cam-operated expansion support between the arms of each knuckle, preventing distortion under cutting load. The broaches finish their cut, and the platen and fixture return to loading position. The broaches then return to the top of the machine while the operator removes the finished parts, fig. 2A, and drops two more parts in the fixture.

RIGHT

FIG. 1—This close-up of the broaching operation shows the broaches and fixtures in loading position.

BELOW

FIG. 2—Steering knuckles before and after broaching.





HENRY BORNITZKE, superintendent of plating, Cutler-Hammer Co., Milwaukee, co-chairman of the convention.

Electroplaters to

FIVE educational sessions, embracing business matters as well as technical aspects of electroplating, will feature the 36th annual convention of the American Electroplaters' Society to be held in Milwaukee, June 27 through June 30.

Among the general topics to be covered in the educational sessions are plating and other treatments for light metals; discussion of acid dips in cleaning cycles; a symposium on copper, nickel and chromium plating; a symposium on business aspects of plating, including the availability of plating materials; and reports on a number of the AES-sponsored research projects.

Plant visitations, to enable convention registrants to see outstanding plants in the area, have been arranged to the Body Div. of Nash Kelvinator Co., X-Ray Div. of General Electric Co., and Glove Union, Inc., all in Milwaukee.

William C. Geissman, assistant superintendent of finishing, National Lock Co., is chairman of the convention with Henry Bornitzke, superintendent of plating, Cutler-Hammer Co., as co-chairman. T. D. Hartshorn is president of the Milwaukee branch of the Society and is serving as chairman of the program committee.

Expansion of the educational program to include economic factors of the industry is expected to be a valuable addition to the general program. In previous years, the sessions have been devoted almost entirely to new techniques and applications of finishing processes; however, the committee felt that, this year particularly, discussion

of business matters would be a worthwhile extension of the program.

The National Assn. of Metal Finishers has scheduled a meeting and luncheon for its directors on Tuesday during the convention for discussion of Association business.

An openhouse, under the auspices of the International Fellowship Club, with music, dancing and a buffet supper, has been arranged for Monday night. Other social activities will include a golf tournament, a picnic and outing, and an extensive ladies' program.

Awards for the outstanding papers presented will be given at the banquet. The Herminie Dorothea Proctor Award is for the best paper presented and the Founder's Gold Medal is given for the best paper by a member. In addition, the AES Gold Medal and a cash prize will be awarded for the best papers printed during the year in Plating Magazine.

Place of registration and convention general headquarters will be the Hotel Schroeder. All educational sessions and the annual banquet, scheduled for Thursday evening, June 30, will be held in the Crystal Ballroom.

As in the past several years, local branches of the society will exhibit plated ware. Prizes will be awarded to the three outstanding exhibits.

Samuel S. Johnston, technical director of the electrolytic department, Weirton Steel Co., Weirton, W. Va., is the incumbent president of the AES, and Arthur W. Logozzo, president, Nutmeg Chrome Corp., Hartford, Conn., is the first vice-president of the Society, and will take over the presidency at the termination of the convention.

Meet in Milwaukee



W C. GEISSMAN, chairman of the 1949 convention, and assistant superintendent of finishing, National Lock Co., Rockford, Ill.

AES Educational Program for 36th Annual Convention

MONDAY AFTERNOON

June 27

2:00 to 4:30 P.M.

"The Customer Looks at Plated Products"—T. H. Westby and R. E. Parkinson, Sears, Roebuck & Co.

"Quality Control in Electroplating"—R. E. Harr, Western Electric Co.

"The Job Plating Business"—R. M. Shock, National Assn. of Metal Finishers, Inc.

"Availability of Plating Materials"—Brief presentations of the outlook on availability of:

"Alkalies, Including Silicates and Phosphates"—J. J. Duffy, Pennsylvania Salt Mfg. Co.; *"Cadmium"*—L. K. Lindahl, Udylyte Corp.; *"Chromic Acid and Chromates"*—Henry Mahlstedt, United Chromium, Inc.; *"Cyanides"*—Ed McGovern, E. I. duPont de Nemours & Co.; *"Lead"*—C. R. Ince, St. Joseph Lead Co.; *"Nickel"*—C. H. Sample, International Nickel Co.; *"Tin"*—B. W. Gonser, Tin Research Institute, Inc.; *"Zinc"*—R. F. Burns, New Jersey Zinc Sales Co.

TUESDAY MORNING

June 28

9:00 to 11:30 A.M.

"PR Cyanide Copper Plating"—G. W. Jernstedt, Westinghouse Electric Corp.

"Electrodeposition of Nickel at High Current Densities"—W. A. Wesley, W. W. Sellers and E. J. Roehl, International Nickel Co.

"Factors That Influence Operating Characteristics of Chromium Baths"—J. B. Winters and R. O. Hull, R. O. Hull & Co.

"Scratch Hardness and Abrasion Hardness of Electrodeposited Chromium"—J. M. Hosdowich, United Chromium, Inc.

TUESDAY AFTERNOON

June 28

2:00 to 4:30 P.M.

"Acid Dips for Ferrous Metals"—I. C. Hepfer, Furniture City Plating Co.

"Prevention of Embrittlement of High-Carbon Steel"—R. M. Wick, Bethlehem Steel Co.

"Acid Dips for Copper and Copper-Base Alloys"—B. H. McGar, Chase Brass & Copper Co.

"Acid Dips for Zinc-Base Metals"—D. M. Overcash, Brown-Lipe-Chapin Div., General Motors Corp.

WEDNESDAY MORNING

June 29

9:00 to 11:30 A.M.

"Plating on Aluminum"—Fred Keller, Aluminum Co. of America.

"Cleaning, Acid Treatment, and Plating Upon Aluminum"—W. R. Meyer and S. H. Brown, Enthone, Inc.

"Amorphous Phosphate Coatings for Protection of Aluminum Alloys and for Paint Adhesion"—Alfred Douty and F. P. Spruance, Jr., American Chemical Paint Co.

"Electroplating on Magnesium and Its Alloys"—H. K. DeLong, Dow Chemical Co.

THURSDAY MORNING

June 30

9:00 to 11:30 A.M.

"Distribution of Electrodeposited Metal on Some Simply Shaped Cathodes"—John Kronsbein and L. C. Norton, Evansville College. (Project 11)

"Outstanding Problems of Porous Structure in Electrodeposits"—N. Thon, Princeton University. (Project 6)

"Present Status of Plating Room Waste Disposal"—B. F. Dodge, Yale University. (Project 10)

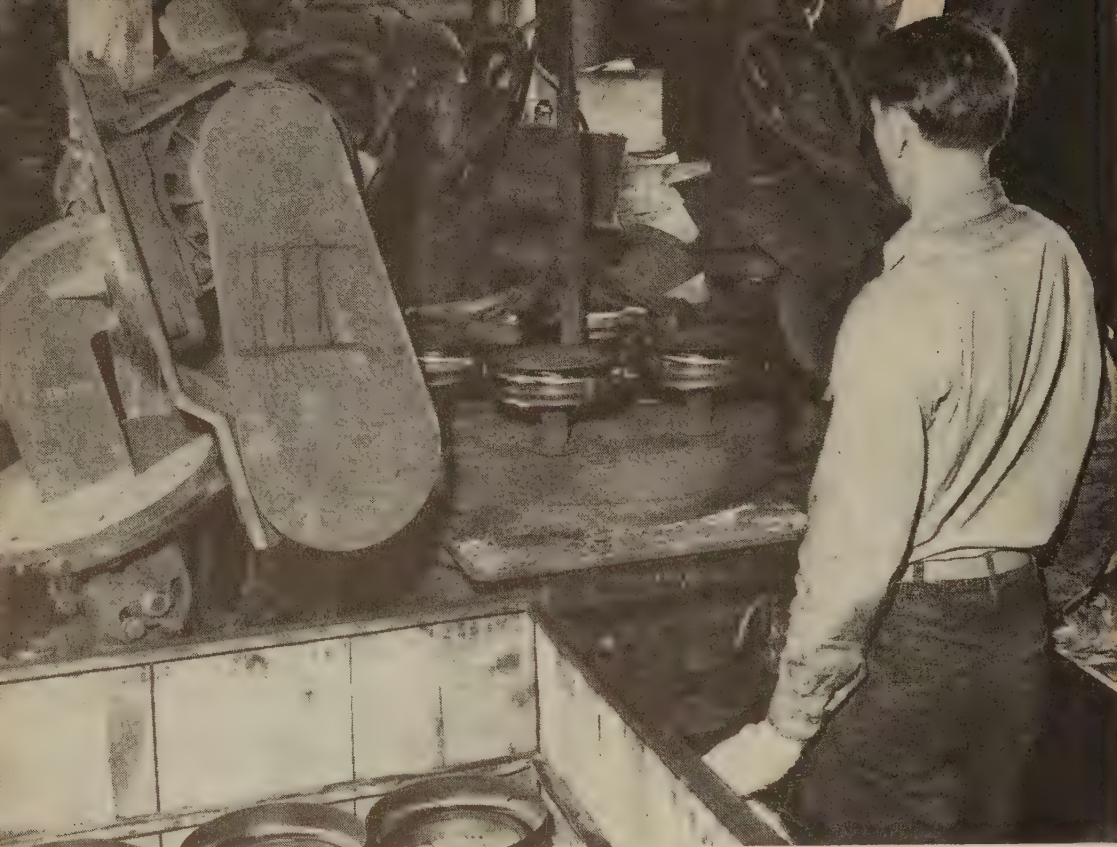


FIG. 1—Buffing machine for waffle iron bases. A liquid compound is sprayed to each of the three buffs. Horseshoe-shaped piece holds the work on the spinning fixtures.

By T. S. BLAIR

Plating Easily

USE of a new composition nickel bath, which gives an easily-buffed electroplate and which has a levelling action during deposition making both preliminary and color buffing less critical and faster, has permitted savings and increased production in the plating department of the General Electric Co. at Bridgeport, Conn.

The method is the Perflow process, developed by Harshaw Chemical Co., Cleveland, and involves the use of an organic addition agent and a wetting agent with a standard Watts bath. Introduction of the process at GE has enabled reduction of the plating time from 45 to 22 min, and the buffability of the deposit has enabled color buffers to turn out 25 pct more work.

Further time and material savings are possible on parts such as the waffle iron bases shown being automatically buffed in fig. 1, for it is now necessary to buff only edges and draw lines. Plain surfaces on the work as it comes from the press, which formerly were buffed, are now left

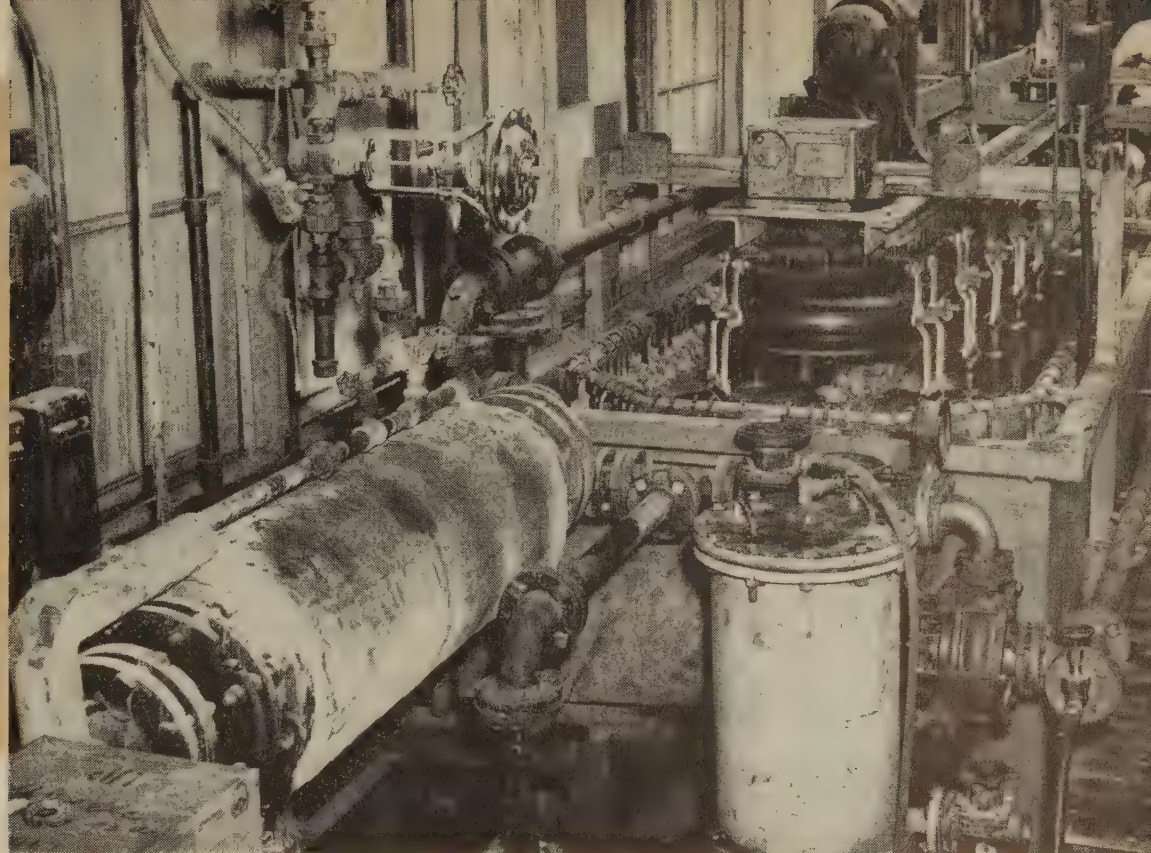
untouched, as the levelling action of the nickel bath plus the flowability of the nickel plate permit reflective finish in the final piece without an overall preliminary buff.

The nickel deposit, having a modified crystal structure, is softer than standard bright nickel. Color buffing, in effect, hardens the deposit so that final properties correspond to standard nickel.

Bath makeup and conditions of maintenance used at GE are given in table I. A rubber-lined 2000-gal tank with a continuous purification system, fig. 2, is used. Electrical supply is through a 12-v rectifier, with 4000 amps available. Presence of the wetting agent controls pitting by lowering the surface tension of the plating solution. Standard bagged XXX carbon nickel anodes are used.

Addition agent replenishment is accomplished in the continuous filtration system. In purification, both the addition agent and wetting agent are removed by the carbon treatment. Replace-

FIG. 2 — Back end of the plating tank and components of the continuous purification system are shown. Heat exchanger is in left foreground, and filter press used to replenish addition agent is in right foreground



Buffed Nickel

... the Perflow Process

A nickel plating process which deposits a soft semibright nickel that fills in surface irregularities during plating and color buffs easily has provided substantial savings and increased production in the plating department of the plant described in this article. Surface preparation of the work prior to plating is less critical, plating time has been reduced and buffing capacity has been stepped up 25 pct as a result of this process.

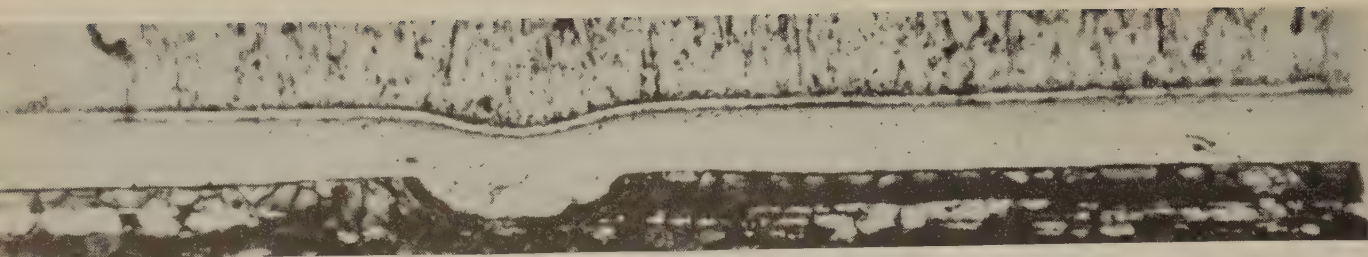
ment of the Perflow addition agent is carried out by loading the filter press twice a day with 1.5 lb of the compound. First a water slurry of the material is prepared and is pumped through the filter while it is out of the purification line. The slurry is recirculated until it is clear, indicating that the addition agent has been picked up on the filters. Then the filter press, a 1000-gal per hr model, is cut back into the purification system so that the solution returning to the tank passes through it. Limited solubility of the compound has been found to provide proper control of addition agent replenishment. Wetting agent additions are made directly to the bath. Every 2 hr the pH is checked, with H_2SO_4 corrections made as necessary.

Complete bath repurification is carried out as required. Controlled conditions and vigilance have been found to extend this time to intervals of approximately 4 months. Repurification is accomplished as outlined in table II.

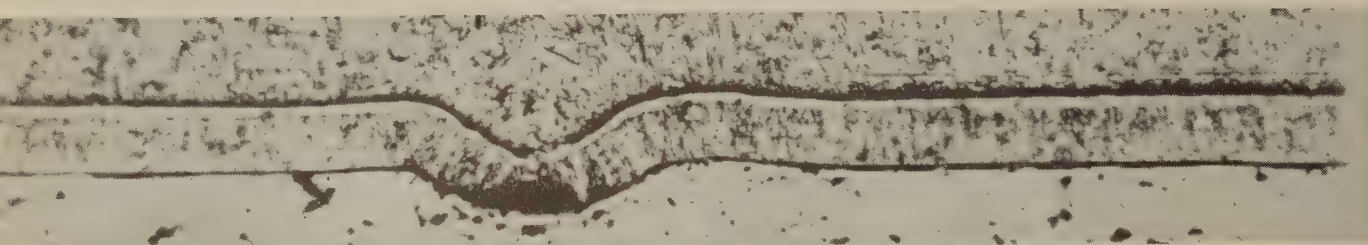
Ability of the bath to fill in surface irregularities during plating is illustrated in the micrographs in fig. 3. Data from studies of this effect are given in table III.

As it comes from the final rinse, the Perflow nickel has a matte appearance compared to bright nickel and the color buffed plate is somewhat softer bright in color. Scratch scars and other imperfections which can be seen in the unbuffed piece are indiscernible after color buffing.

Prior to plating, steel pieces come straight



Perflow bath deposit in cross section



Watts-type bath deposit in cross section

FIG. 3—Sectioned pieces illustrate levelling action provided by the plating bath. Profilometer data on fill-in of surface imperfections are given in table III.

TABLE I

Composition of Nickel Bath and Conditions of Operation

$\text{NiSO}_4 \cdot 6 \text{H}_2\text{O}$	44 to 48 oz per gal
$\text{NiCl}_2 \cdot 6 \text{H}_2\text{O}$	6 oz per gal
H_3BO_3	5½ oz per gal
Perflow Addition Agent	0.5 to 1.1 lb per 100 gal
XXX-D Wetting Agent	0.3 pct by vol

Temperature	130°F
pH	3.8 to 4.1
Current Density	40 amps per sq ft

TABLE II

Bath Repurification Method

- (1) Solution pumped through filter into storage tank. Activated carbon (NuChar C115, 4 lb per 100 gal) added at operating temperature and pH.
- (2) Add 0.3 cc per gal of 100 vol H_2O_2 and agitate for 8 hr at 150° to 160°F.
- (3) Raise pH to 5.6 with chemical lime, 10 lb per 1000 gal. Then add 20 lb per 1000 gal NiCO_3 to remove Ca as CaCO_3 . Agitate for at least 4 hr.
- (4) Filter back into cleaned plating tank. Anodes and bags should be inspected and the tank lining checked for breaks during repurification.
- (5) Add XXX-D wetting agent and Perflow addition agent in proper concentrations and resume plating operations.

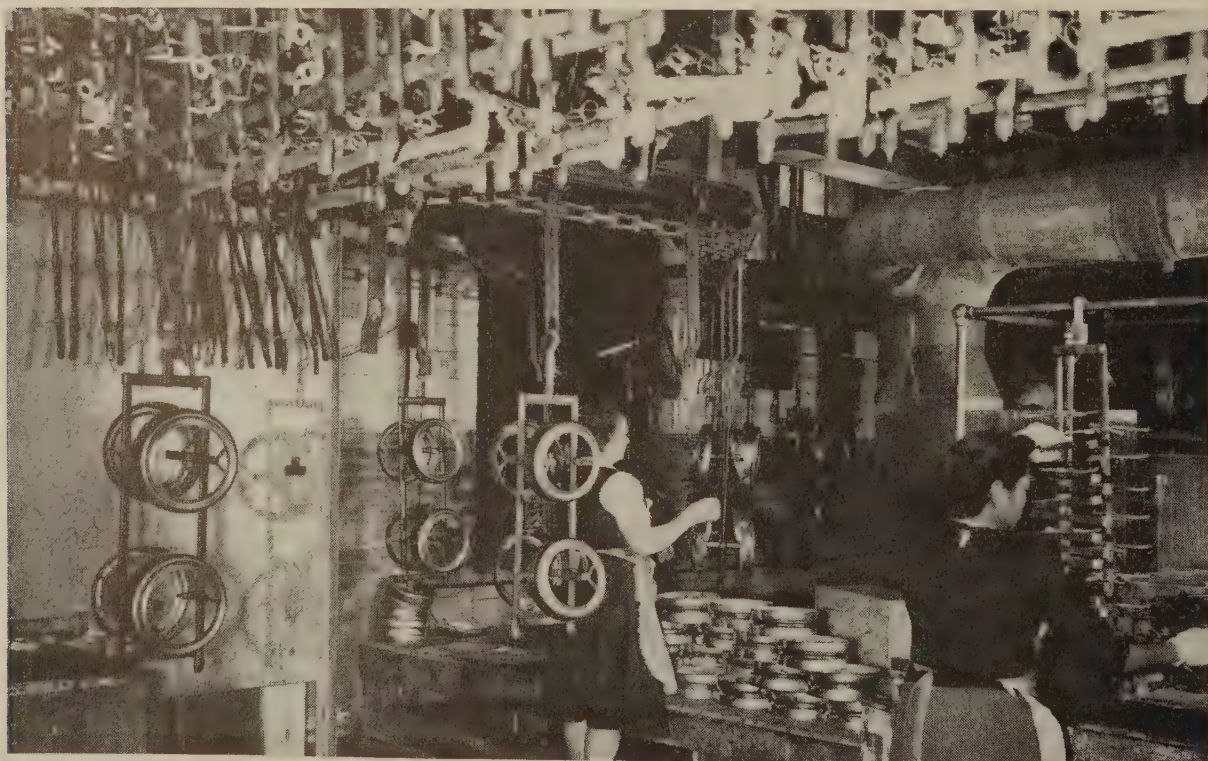


FIG. 4—Racking and unranking station. Parts when first racked move off to the left and double back through the spray cleaner, exit end of which is shown. In rear right is the electrolytic cleaning machine. Tanks of this machine run straight-away to the nickel tank.

from the presses and edges and draw lines are cut down with 220 emery. The pieces are then racked, as shown in fig. 4, to be carried through a spray cleaning machine for removal of drawing and polishing compound residues. In this spray tunnel, the parts get an alkali spray (Hydrex 100, 6 oz per gal, at 170°F), a cold rinse, another alkali spray (same composition) and a cold and hot (180°F) rinse.

On leaving the spray tunnel, the conveyer takes the parts through a cold and hot blast air drier to a Stevens semiautomatic cleaning machine. Racks are transferred to the mechanical cam-action lifts of the machine and are taken through a dip tank cycle. The first tank is for reverse current alkaline cleaning (Enthone HC, 6 v), and is followed by a cold rinse, a 50 pct muriatic acid dip and two more cold rinses. It is immediately transferred to the semiautomatic plating tank where it receives a 0.001-in. plate, the tank conveyer being set to give a 22-min plating cycle. Conveyer movement, about 1.5 to 2 fpm, plus the circulation furnished by the continuous purification system provide all the agitation that is required.

On removal from the plating tank, the racks are transferred back to the mechanical lifts of the electrolytic cleaning machine to be given

TABLE III
Levelling Ability of the Nickel Bath. Profilometer Data

Before Plating		After Plating to 0.001 in. Thickness	
RMS*	120	RMS	38
	37		6
	8		<1
	4		<1
		After plating to 0.002 in. Thickness	
RMS	120	RMS	18
	37		3½
	8		<1
	4		<1

* RMS (root mean square) factor represents average deviation of surface irregularities from a theoretically perfect surface.

three rinses, fig. 5, prior to unracking and color buffing.

By simplifying buffing operations and shortening plating time the process has effectively increased capacity. Further savings are derived from lessened requirements for buffing compounds and equipment per piece of finished work.

Following the nickel plating and coloring described in this article, pieces are given the usual chrome finish.

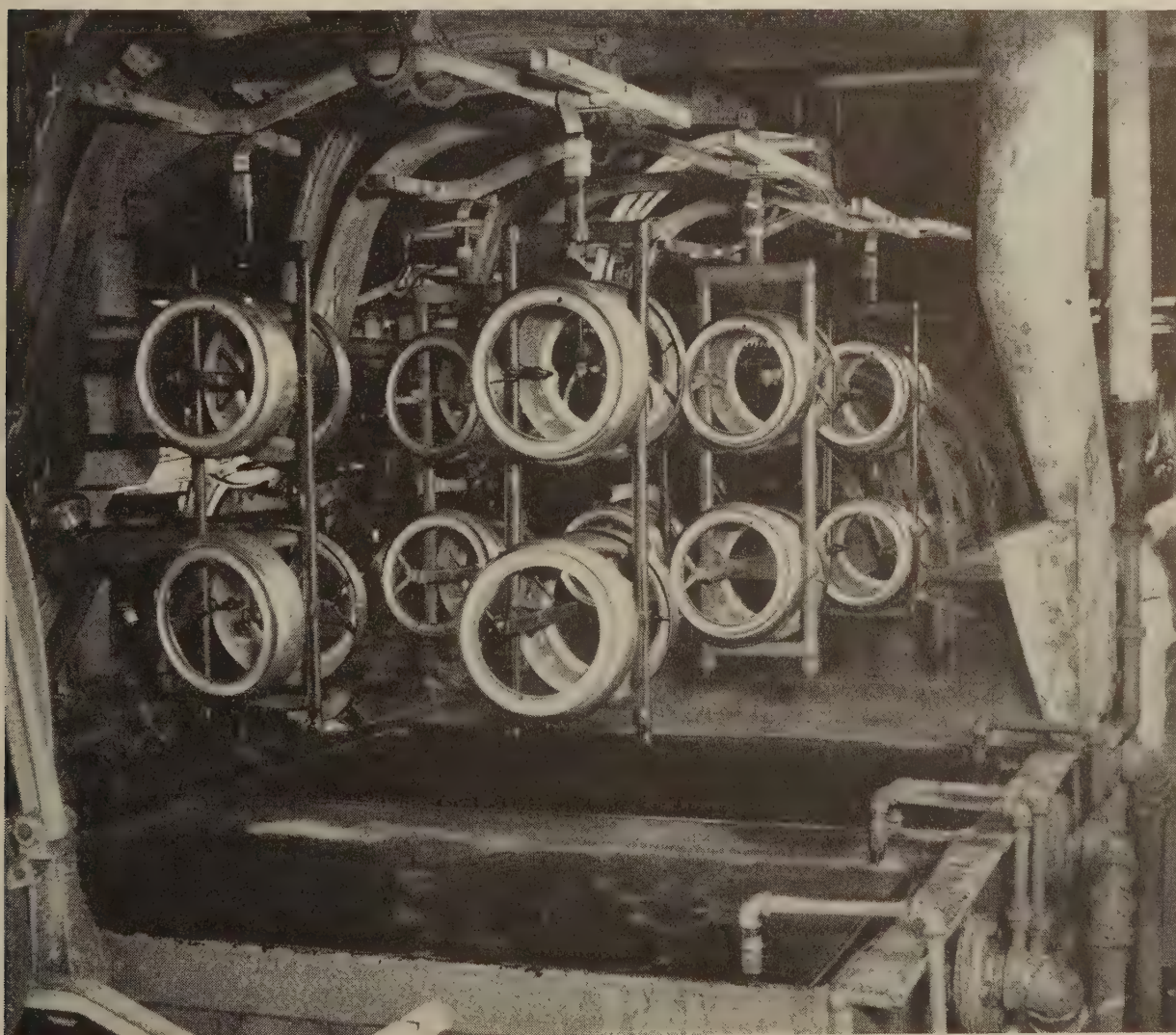


FIG. 5—After plating, racks are returned to lifts of the electrolytic cleaning machine for three rinses and return to the racking and unracking station.

Boron-Titanium Steels for

IN an effort to find a simple inexpensive alloy addition to prevent grain size coarsening in low carbon titanium steels at normalizing temperatures above 1625°F, boron, in amounts up to about 0.1 pct, was employed. In the course of the investigation, a series of low carbon steels, containing various small amounts of boron, titanium and other alloying elements, was manufactured (see table I) and considerable mechanical property data were determined concerning these alloys.

The steels described in this report were melted in a 30-lb high frequency induction furnace and thoroughly killed with aluminum before additions of boron and titanium in ferroalloy form. The ingots were forged or rolled to bars without any apparent difficulty. As a matter of convenience most of the hot-working was done at temperatures below 2050°F.

Forgeability of these steels, containing boron to the extent usually found to produce hot shortness, is apparently related to the fact that sufficient titanium was present to combine with all

of the carbon. Evidently it is not boron or a boride that promotes hot shortness but a low melting ternary iron-boron-carbon eutectic which melts at ordinary hot-working temperatures. With the carbon fixed as titanium carbide, this fusible eutectic is not formed and the steel can be satisfactorily hot worked.

Steel No. 2 (listed in table I) containing boron, showed a slightly greater quenched hardness than steel No. 1; it also displayed greater hardness retention after slower rates of cooling, and equal resistance to tempering. For example, when quenched in water from 2100°F, steel No. 2 indicated a RB hardness of 101, while the first steel showed 94. Variations in cooling practice followed in some cases by tempering affected the hardness properties of each of the steels, influencing steel No. 1 much more than No. 2.

Titanium or columbium, when used with boron, provided much greater hardness (air-cooled specimens) than is obtained by similar treatments with titanium or boron alone. Em-

TABLE I

Steels Containing Boron, Titanium and Other Alloy Elements, Examined for Determining Influences of These Alloys on Physical Properties.

	Steel No. 1	Steel No. 2	Steel No. 3	Steel No. 4	Steel No. 5	Steel No. 6	Steel No. 7	Steel No. 8	Steel No. 9	Steel No. 10	Steel No. 11	Steel No. 12	Steel No. 13
C, pct	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.06	0.06	0.06	0.07	0.07	0.07
Mn, pct	0.22	0.23	0.23	0.32	0.34	0.33	0.19	0.41	0.44	1.29	1.36	0.51	0.51
Si, pct	0.09	0.09	0.09	0.11	0.10	0.10	0.12	0.29	0.23	0.44	0.55	0.41	0.41
Cr, pct													
Mo, pct								2.82	6.14	18.08	17.51	2.2	1.05
B, pct		0.03	0.03	0.02	0.01	0.03	0.018	0.025	0.02	0.02	0.03	0.02	0.02
Ti, pct	0.28	0.30	0.30	0.36	0.24	0.19	0.32	0.30	0.24	0.38	0.49	0.32	0.33
Ni, pct										10.91	11.35		

TABLE II

Room Temperature Properties of Titanium-Boron Steels Nos. 3 and 4

	Steel No. 3	Steel No. 4
Hardness, RB	40 ¹	85 ³
Yield strength, 0.2 pct offset, Psi	31,000	70,300
Tensile strength, Psi	44,700	84,400
Elongation in 2 in., Pct	44.0	21.0
Reduction of area, Pct	85.7	79.0
Izod impact value, Ft-lb	115	24

¹ Air-cooled from 1600 °F; not tempered.

² Air-cooled from 1800 °F; tempered at 1000 °F.

³ Air-cooled from 2100 °F; tempered at 1200 °F.

FIG. 1—Stress v. time for rupture at (A) 1000°F, (B) 1100°F, and (C) 1200°F. (A) Steels Nos. 3 and 4, X and O, respectively, quenched from 2100°F and tempered at 1200°F; molybdenum-titanium steel (Ti: C = 7.2) tempered at 1200°F; carbon-molybdenum steel annealed at 1650°F. Arrow indicates specimen not broken. (B) Steel No. 8 air cooled from 2100°F (O = tempered at 1100°F; X = tempered at 1300°F); steels Nos. 4 and 7 air cooled from 2100°F and tempered at 1000°F. (C) Steel No. 9 air cooled from 2100°F (O = tempered at 1100°F; X = Tempered at 1300°F). Steel No. 10 designated by dots and No. 11 by open squares.

Moderate Temperatures

playing a hardening temperature of 2100°F, for example, revealed a columbium-boron and a titanium-boron steel to possess 93 RB, while a titanium and a boron steel showed hardnesses of 65 and 45, respectively. On tempering at 1000° to 1100° or 1200°F, a slight increase over the air-cooled hardness was noted, above which temperature a considerable loss in hardness resulted.

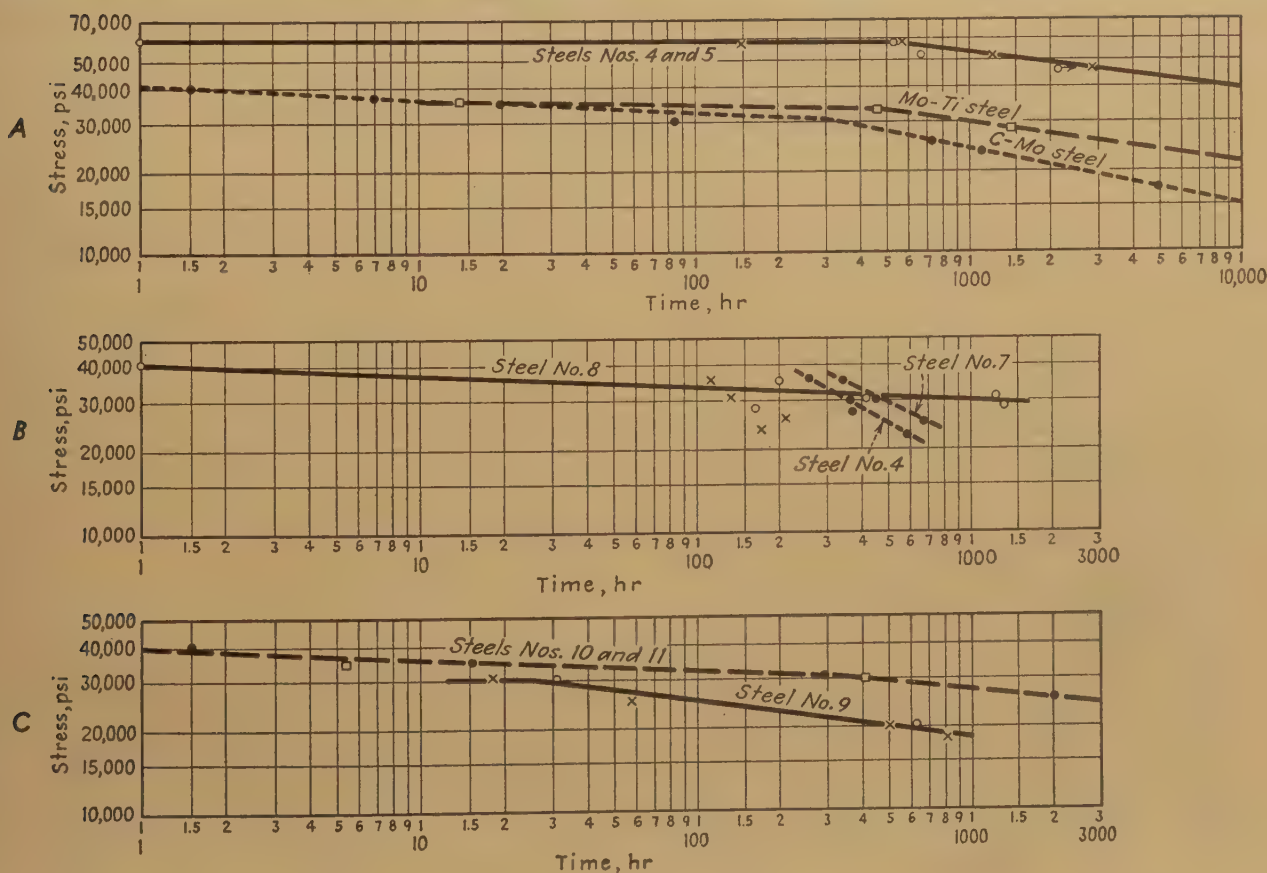
Room temperature tensile properties of steels Nos. 3 and 4 are given in table II. The strength is somewhat doubled in the hardened and tempered condition with very little loss in reduction of area. Notch sensitivity of these titanium-boron steels is rather high in the hardened and tempered conditions of maximum hardness, but impact values can be improved either by hard-

ening at a temperature below that giving the maximum hardness or by tempering at a temperature sufficiently high to decrease the hardness slightly. The latter practice seems to be most satisfactory in that overtempering results in a great increase in impact value with only a slight drop in hardness, while with underhardening, the decrease in hardness is large.

Notch sensitivity of hardened titanium-boron steel seems to be a property of the ferrite and is not related to any change in grain size or microstructure that has so far been discovered. Additions of up to 1.6 pct Mn, 2 pct Ni, or up to 4.8 pct Cr have been tried in an effort to improve notch toughness but have not shown any important degree of success. Nickel may be slightly beneficial but manganese and chromium seem to be detrimental.

Stress rupture tests were conducted at temperatures of 1000°, 1100° and 1200°F. Fig. 1A indicates the superiority of two titanium-boron steels (steels Nos. 4 and 5) over molybdenum-

This article is an extended abstract of the paper entitled "Ferritic Low Alloy Boron-Titanium Steel for Use at Moderately High Temperatures," delivered by G. F. Comstock, assistant director of research, Titanium Alloy Mfg. Div., National Lead Co., New York, at the Recent Western Metal Congress.—Ed.



titanium steel and a carbon-molybdenum steel. Tests at 1100°F (fig. 1B) revealed a chromium-titanium-boron analysis (steel No. 8) possessing a rupture strength of 30,000 psi for 1000 hr life. This is far above the reported strength of any other ferritic steel under similar conditions, even comparing favorably with reported values for austenitic steels. The broken lines in the figure refer to steels Nos. 4 and 7.

A few stress rupture tests made at 1200°F on a 6 pct Cr steel (steel No. 9) and two 18-8 austenitic steels (Nos. 10 and 11), all containing boron and titanium, are reported graphically in fig. 1C. The rupture test results on steel No. 9 compared favorably with published values for austenitic steels at 1200°F, while those obtained from the 18 Cr-11 Ni titanium-boron steels are definitely superior. An even better result was obtained in a single test of an 18-11 columbium steel with boron, water-quenched from 2300°F, tempered at 1500°F, which required 816 hr for rupture at 1200°F and 40,000 psi.

A test was also conducted whereby two steels were made (steels Nos. 12 and 13), containing molybdenum, titanium and boron, to determine whether the high temperature effects of both additions could be superimposed upon one another. The test of the 0.5 pct Mo steel was terminated by overheating due to failure of the temperature control at 1022 hr, but the specimen

of the .1 pct Mo steel was removed unbroken after 3312 hr with 2 pct elongation. Thus it appears possible to obtain greater rupture strength at 1100°F by using molybdenum with titanium and boron in a suitably heat-treated low alloy steel.

Although it was felt to be fairly certain that no graphite could form in any steel containing sufficient titanium to combine with all the carbon, actual tests for graphitization at 1100°F were carried out on steels Nos. 4, 5 and 6. Some of the titanium-boron steel specimens have been removed periodically from the furnace (test is still underway) sectioned through a brinell impression or through the weld bead, polished and examined at high magnification for graphite. The last inspection was after 5000 hr and no graphite has been found in any of them except in one doubtful instance within a weld bead which was not a titanium steel. The method of improving the high temperature rupture strength of ferritic steels by adding 0.01 to 0.03 pct B and over six times as much titanium as carbon, hardening by air cooling or quenching from above 2000°F, and tempering at 1000° to 1200°F is applicable to oxidation resistant steels containing 2 to 6 pct Cr. The method is also applicable to the improvement of the rupture strength at 1199° or 1200°F of molybdenum and high alloy steels.

Progressive Dies Form House Panels

TWO of the most common items in the construction of the Lustron house are the 2x2 ft exterior wall panels and the 2x4 ft roof panels. There are 250 wall panels, requiring four operations each, per house, and production is aimed at 100 houses per day. This represents 100,000 press operations per day. Each of three 600-ton presses making up the production line for this item has a 64x180 in. bolster, 36-in. stroke, and is equipped with automatic feeds so that coil stock can be fed into the machine. Four dies, mounted in the press bed in a straight line, perform the notching, forming, camming, piercing, embossing and finish-blanking in a continuous operation.

Stock is fed from Littell feeds into the dies and is carried through on guides. Stock trim aids the through-feed of the material, not being freed from the stock until finish blanking. Scrap is cut up as it leaves the bed of the press and the panel slides out of the last die into a chute that

places it in position for delivery to the enameling dept.

The 2x4 ft roof panels are made from 54 in. coil stock fed through a progressive die setup installed in a 1000 ton press with a bolster area of 92x180 in. Production of this part is 176 per house, or 17,600 per day. The installation in this press consists of dies for notching and lancing, drawing, restrike camming, piercing, and finish trim. The latter is equipped with a mechanical ejector and parts feed through the press onto stock guides and lifters.

While progressive die setups are not new in sheet fabricating, the manufacture of these parts prove what can be done by product design where volume justifies the cost of such dies. To have deviated from the setups described would have required an additional 50,000 sq ft of floor space plus a considerably higher capital equipment investment. A total of 163 presses are used in fabricating the various components of the Lustron house, the largest being a 5000-ton press for forming the bathtub.

Further Gear Standardization Urged by AGMA

Gearing standards extension emphasized at 33rd meeting of gear association . . . F. W. Walker elected president . . . A. H. Candee receives Connell award.

THE keynote of discussions at the 33rd annual meeting of the American Gear Manufacturers Assn., at the Homestead in Hot Springs, Va., June 6 to 8, 1949, was the problem of standards for gears and gearing in American industry. The need for furthering present standards was indicated in a symposium lead by J. H. Hunt, consulting engineering for General Motors Corp., L. D. Price, manager of engineering developments for the National Electrical Manufacturers Assn., W. P. Schmitter, chief engineer of Falk Corp., and S. L. Crawshaw, director of engineering and sales for Western Gear Works. H. W. Bennett, in a talk on gear motors, further emphasized the need for standards pertaining to this phase of the gear industry.

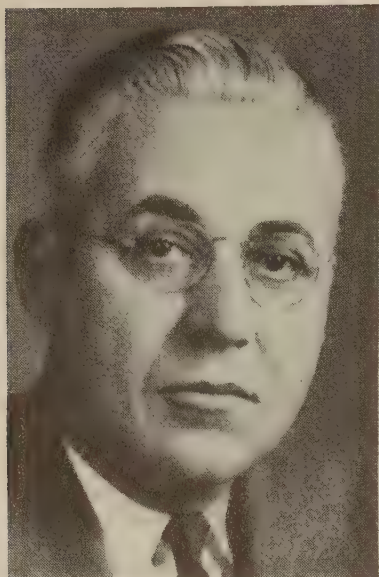
Included also in the program was the election of officers and directors and the awarding of the 1949 Connell Award. Allan H. Candee, of The Gleason Works, Rochester, N. Y., was the 1949 recipient of the Connell Award, an award that can be made annually by AGMA in memory of the late Edward P. Connell, vice-president of The Falk Corp. Mr. Candee received the award in recognition of his many valuable contributions to the gearing industry's technical knowledge and literature over the past 30 years.

F. W. Walker, executive vice-president of the Philadelphia Gear Works, Inc., Philadelphia, was elected president of AGMA, having served during the past year as vice-president and previously on numerous AGMA committees. Leroy Brooks, Jr., president of the Tool Steel Gear and Pinion Co., Cincinnati, was elected vice-president, having served for the past two years as a member of the association's executive committee. Roger B. Salinger, president of the Massachusetts Gear

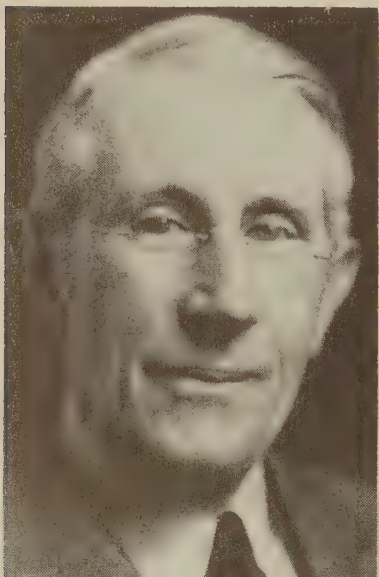
& Tool Co., Woburn, Mass., was reelected treasurer.

Elected to the association's executive committee were: Robert B. Moir, vice-president and chief engineer of Foote Bros. Gear & Machine Corp., Chicago; Paul W. Christensen, president of Cincinnati Gear Co., Cincinnati; George H. McBride, sales manager of the Nuttall Works, Westinghouse Electric Corp., Pittsburgh; and George H. Sanborn, chief field engineer, Fellows Gear Shaper Co., Springfield, Vt. The terms of office of these men as members of the executive committee will terminate June 30, 1952.

At the standards symposium, one of the outstanding meetings of the convention, the history, philosophy and need for gear standards were discussed, but probably more important were the descriptions of how NEMA, SAE, and the individual automotive companies developed and adopted them. J. H. Hunt, consulting engineer for General Motors and a past president of SAE, pointed out the basic differences between standards developed by SAE and those developed by AGMA. AGMA looks primarily towards the supplier of gears when it writes standards, but SAE must look primarily toward the user. The automotive industry has worked on the basis that a standard is of no value unless it reduces costs or improve manufacturing practices. While the use of SAE standards is voluntary with the automotive companies, their acceptance has been widespread both in the automotive industry and in many closely allied industries. Starting with the standards on SAE fine threads, developed in the early 1900's, Mr. Hunt briefly described the various types of products for which SAE has established standards, including spark plug threads, steel, small parts and fittings, lamp



• F. W. Walker,
President



• Leroy Brooks, Jr.,
Vice-President

bulbs and bases, washers and many other items.

Mr. Hunt especially emphasized the progress made in the establishment of SAE standards for steel which were, shortly before the war, accepted as standards by the American Iron and Steel Institute. Since both users and producers were on the committees that set up steel specifications, the agreement on what should or should not be included represented the best opinions of all interested parties.

The original standards specified the chemistry of the steel, wiping out the practices of steel producers selling on the basis of brand names. Now, however, there is a concerted attempt on the part of SAE to write standards based on end results rather than on means of obtaining those results. Consequently, considerable work has been devoted to establishing steel specifications on the basis of hardenability instead of chemistry, and about 75 steels have now been thus standardized. Always, Mr. Hunt pointed out, is there a con-

stant effort to provide means of substitution for a specification in order that neither a shortage nor an abnormal price situation will cause too much difficulty.

The development of individual company standards, a practice that is becoming rather widespread in the automotive industry, is based largely on or parallel national standards and such standards are primarily production or purchasing standards. They are designed mainly to reduce costs, improve manufacturing practices, simplify design and production programs, reduce the number and sizes of parts, and reduce the necessity for large inventories of a great many different types of parts. Furthermore, large companies that make several models of automobiles and market them under different brand names carry on an internal component standardization program. Power plants, gear boxes, and transmissions likely may be standardized for several brands of cars; and many expensive parts such as body components often are designed for more than one model. All of this work on standardization by the Society of Automotive Engineers is conceded to have been of utmost economic importance to the automotive industry, and efforts constantly are being made to further the work of standardization.

L. D. Price, of NEMA, confined his remarks to the procedure by which NEMA sets up electrical standards. These standards, like those of SAE, are the consensus of qualified engineers and it has been found that users of these standards have experienced reductions in manufacturing costs.

Working with NEMA in its development of standards for electrical apparatus are such organizations as the American Society for Testing Materials, the American Standards Assn., the U. S. Bureau of Mines, the Underwriters Laboratories, and similar organizations. The results of NEMA standards, according to Mr. Price, are that they form cornerstones for mass production, effecting design, material, production, processes, sales, inventory and distribution.

S. L. Crawshaw of Western Gear Works, outlined the work of AGMA in establishing gear standards. In the early 1920's, he pointed out, activity was devoted mainly to nomenclature of tooth forms, chain and sprocket data, keyways, and the development of accounting procedures for gear manufacturers. The 1930's saw the work devoted to programs on closed drive gear units, tooth contacts, shafting, bearings, and lubricants. With the beginning of the war, AGMA activities were basically in the phases of interchange of information, quality control, inspection, increased loads and speeds, fine pitch gears, and standard drafting techniques.

Engineering committees of AGMA appeared devoted to the establishment or improvement of standards. The engineering committee on fine pitch gearing has been working closely with the American Society of Mechanical Engineers on the development of standards for fine pitch gearing, and it appears that these standards at present are just about ready for approval by the AGMA.

On enclosed gear drives, tentative standards

have been developed for application specifications, output speeds, shafting, bearings, and diesel and diesel-electric marine gear drives. A survey of AGMA members on inspection standards as now in effect indicates the necessity of some alterations. Also being considered are lubrication of aircraft gas turbine standards. Standards for complete practices for worm gearing have been drafted, as well as for various types of gear cutting tools. Standards on involute splines are expected to be reviewed, but until this review is completed present ASA standards will remain in effect.

In a study of nomenclature and gear geometry, it was reported that the committee is awaiting the reissue of ASA standards on letter symbols for gear engineering, before reviewing the subject, and, at that time, the information will be added to AGMA standards. Standard gear specification drafting practices, under consideration since 1942, has not been yet agreed upon. It is felt that drafting standards will be divided into two parts, one dealing with commercial gearing and the other with precision gearing.

In a review of all the AGMA standards in effect and pending, the strong and weak points of the present standards lists were brought out. It is evident that there will be considerable effort expended in the near future on developing or modifying standards for oil field gearing, steel mill gearing, surface durability of gears, non-metallic gearing, thermal ratings and cooling of gears, bores and keyways, helical and spur tooth-form acceptable limits, drafting methods, and surface finish; and need was emphasized for standards and practices on gearing for the aeronautical, automotive, and utility industries. AGMA is also in correspondence with the British with respect to gear nomenclature and bevel gear standards, and expressed interest in recent work in Brazil in the establishment of engineering practices relating to gearing.

Concluding the meeting was a paper by H. W. Bennett, manager of the gear motor sales division of General Electric Co., entitled, "The Gear Motor, A Symbol of Packaged Power." Development in gear motor drives, applications, design, and other factors influencing the manufacture and sale of gear motor drives were the main themes of the paper. The gear motor drive, developed in the early 1930's, has had remarkable acceptance, largely because of its flexibility, control, and compactness.

Such applications as driving cooling tower fans, conveyors, rotating drums, agitator paddles in vats, dough mixers, ventilating fans, draw benches, hoists, traction drives, and compressors are the most common uses for gear motor drives. Now, however, it is believed that greater standardization in gear motors and components will receive considerable attention.

Mr. Bennett expressed the belief that the gear motor drive will be reduced in size. This reduction will come because the future electric motor will be smaller and the size of gears will be smaller. Gears will be smaller because of bet-

• Roger S. Salinger,
Treasurer



• Allan H. Candee,
1949 Recipient of
the Connell Award



ter materials and better use of such materials, as well as the liberalization of limitations in the use of materials.

One of the major problems with most gear motor users is that of motor replacement. Since the gear motor is an integral unit, either a partial or complete special motor is normally used. Mr. Bennett stated that the industry could get back to the use of standard motors by building both the motor and the gear as complete units. This is done today in unit type drives, solving the problem of motor replacement since stock motors are used. However, it accomplishes this result at the expense of compactness.

The demand for increases in speed will likely mean that there will be used some of these new high speed motors in gear motors. Noise limit standards may likewise be required, as will standards describing the atmospheric conditions in which certain types of gear motor units should operate without difficulty.

Hard Chrome Plating



RACKED milling machine quill and the housing in which it rides up and down in operation.

Advantages of hard chrome plating in providing surfaces with good frictional hardness and heat resisting properties and in rebuilding worn machine parts have been well established. In this article a complete cost breakdown, enabling establishment of a cost per square inch figure, and a description of the plating process for a typical part—a milling machine quill—is given by the author.

HARD chrome plating offers distinct advantages for many machine tool parts. It is durable, heat resistant and has a lower coefficient of friction than any of the common metals. In the machine tool field hard chrome surfaces have been used on jig borer parts, screw machine and grinder bearings, gears, pinions, sliding jaws, on the slides and ways of various machines where the part is subject to heavy wear and in other applications where the properties of plated chrome have proved advantageous.

To demonstrate the effectiveness of hard chrome and to indicate the techniques required and the economics involved in its application, this article will report the experience obtained on a particular part—the quills used in milling machines built by Bridgeport Machines, Inc., Bridgeport, Conn. One of these quills is shown in the accompanying illustration.

Quills in these machines are not subject to the same action as revolving spindles or shafts, for example, yet considerable side stress loads are involved as the quill runs up and down the ground and lapped cast-iron housing.

Bridgeport Machines has been hard chroming quills since 1935. Recently the fourth such machine put into operation was returned for reconditioning. Most parts needed to be replaced or rebuilt. However, the quill and the cast iron housing were not worn appreciably and were replaced without either surface being reworked.

By **WARREN SCHMIDT**
President
City Plating Works, Inc.,
Bridgeport, Conn.

Milling Machine Quills . . .

Comparative procedures for producing the quills with and without a chromed surface are shown in table I. The chromed part does not require carburization, and, with no distortion from heat treatment, no straightening grind is required. These considerations remove the cost differential so that the chromed surface is obtained at no extra cost.

Cost analysis for this hard chrome plating job, done at City Plating Works, Inc., Bridgeport, is shown in table II. The figures are worked out on the basis of a 0.0075-in. chrome surface applied to the part. As shown, the cost to the machine manufacturer is \$1.95. This amounts to 2.8¢ per sq in., a figure which may be valuable to those considering the use of chromed surfaces. A bright plate, to obtain maximum hardness of about 67 Rc, is applied.

The quills, as delivered to the plating shop, are already degreased and quill teeth are masked with a fusible solder which will be melted out in boiling water on return.

Racking the quill for plating involves placement of washer thieves at each end of the quill. A special copper strap rack is used. The rack is covered with Tygon masking tape or equivalent to prevent dissolution in the plating bath. The first step is an electrolytic alkaline cleaning cycle, using a 30-sec direct current followed by a 10-sec reverse current. After a running water rinse, the part is reverse-current etched in a 33-oz per gal solution of H_2CrO_4 . The rack is then transferred to the hard chrome tank.

To obtain less buildup on the ends of the quill, a 55-oz per gal bath, maintained at 135°F, is used rather than a lower concentration solution. Toward the same end, plating speed has been cut back so that an excess buildup of not more than 0.002 in. will be obtained on the OD of the quill ends.

A current density of 576 amps per sq ft is used. Fifteen quills, involving a total amperage of 4200 amps, are plated simultaneously. Plating time is 8 hr.

It has not been found necessary to relieve hydrogen embrittlement after plating. Any fatigue strength losses of the base metal due to plating are reduced to a minimum by the subsequent grinding and lapping to dimension. Specifications call for a 0.0075-in. plate. Grinding and lapping reduce this to a 0.004-in. thickness on the completed part.

TABLE I

Procedures, With and Without Hard Chrome Application, for Producing Milling Machine Quills

Procedure Without Chrome	Procedure With Chrome
(1) Rough machine.	(1) Rough machine.
(2) Carburize with no quench to 25 to 30 Rc by 1650°F in gas furnace for 5 hr. Parts cooled slowly in furnace.	(2) Strain relieve at 800° to 1200°F in electric recirculated-air furnace. Cooled in air after reaching temperature.*
(3) Machine away carburized area and grind to straighten.	(3) Finish machining, grind and lap.
(4) Harden and draw to 60 to 62 Rc.	(4) Hard chrome plate (67 Rc).
(5) Finish grind hardened surface.	(5) Finish grind chrome surface.
(6) Lap.	(6) Lap.

*No distortion from heat treatment.

TABLE II

Breakdown of Costs and Charge to Customer for Hard Chroming Milling Machine Quill

MATERIALS	
At 27½¢ per lb for chromic acid flake, cost is 2¢ per sq ft per 0.001 in. thickness of plate.	
For 0.0075-in. plate, cost per quill at 50 pct efficiency, caused by losses due to vapor exhaust, waste plate on racks, etc., is..	\$0.150
ELECTRICITY	
280 amps per quill x 5 v = 1400 w x 8 hr = 11.2 kw-hr.	
At 2¢ per kw-hr, cost per quill is..	0.224
DIRECT LABOR	
Figuring ¼ hr per quill required for racking, handling, unracking, stripping racks, etc.; @ \$1.60 per hr, cost is..	0.400
OVERHEAD	
At 150 pct of direct labor cost.....	0.600
Total Plating Shop Cost.....	\$1.374
SALES AND ADMINISTRATION EXPENSE	
At 30 pct of total shop cost.....	0.412
SHOP PROFIT	
At 16.4 pct of direct labor plus overhead costs	0.164
Charge to Customer.....	\$1.950

... Vapor-Phase Deposition of

DEPOSITION of protective coatings of high-melting metals—especially the borides, carbides, silicides and nitrides of these metals—on materials for high-temperature service offers a means of circumventing difficulties arising from pronounced activity or low melting characteristics of base materials.

Conventional processes are frequently inadequate for preparing such coatings, as the materials are generally too hard or too brittle to ma-

This report is an abstract of "The Vapor-Phase Deposition of Refractory Materials" by I. E. Campbell, C. F. Powell, D. H. Nowicki and B. W. Gonser, Battelle Memorial Institute, Columbus, Ohio, presented at the 95th Annual Meeting of the Electrochemical Society, Philadelphia, May 6, 1949.

chine, roll or work; are too high melting or chemically reactive to cast or weld satisfactorily; and are not susceptible to electroplating.

It is possible in many instances, however, to apply the coatings by vapor deposition. In such methods a volatile compound of the material is passed over the work which is heated to a temperature such that the compound will be decomposed or reduced at the surface to form an adherent coating. Byproducts of the reaction can be pumped off, flushed off in a stream of carrier gas or removed by combination with a mass of heated metal included in the system. These processes should not be confused with evaporation or sputtering techniques.

A wide variety of products and materials have been coated by vapor deposition. Adherent, non-porous deposits of all the materials listed in table I (except some of the oxides) have been obtained on one or more of the following: copper, nickel, iron, tantalum, molybdenum, tungsten, a variety

of alloy steels, graphite, porcelain, quartz, alumina, pyrex and carbide compounds.

In addition to wire, rod, tubing and strip, articles such as pyrometer wells, die blocks, nozzles, crucibles, cyclotron and X-ray tube targets, and magnetron rings have been coated. Most of the work has been carried out as a batch process, but certain of the metals (Cb, Ta, Mo, W) have been coated on iron, copper and molybdenum wires by a continuous-flow process.

On a commercial scale, the process has been used mainly for coating lamp filaments and electronic tube elements with carbides and refractory metals. Foote Mineral Co. is producing ductile zirconium in commercial quantities by the iodide decomposition process, and the similar production of ductile titanium is under development at Battelle and probably elsewhere.

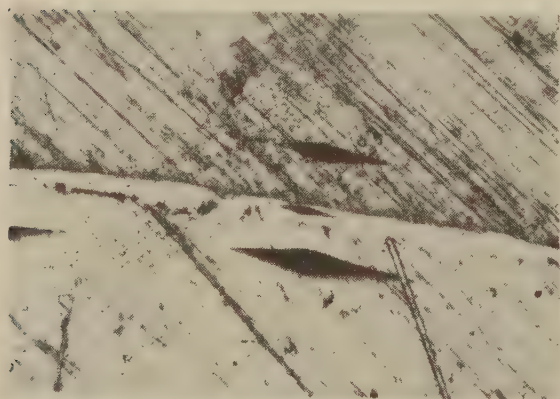
Siliconizing is a commercial process for improving the corrosion resistance of iron articles and chromizing is coming more and more into prominence for the same purpose.

The hydrogen-reduction process has been developed for depositing Cb, Ta, Mo and W on commercially useful articles, but has not been exploited commercially as yet.*

Micrographs of some typical deposits are shown in the accompanying illustrations.

In many applications, the body of an object is not excessively heated yet fails through progressive attack initiated at some point of a heated surface. Vapor plating with a thin film of a high-melting material resistant to oxygen, nitrogen, water vapor, etc., helps to avoid this. Specific applications might be combustion and exhaust

* C. F. Powell, I. E. Campbell and B. W. Gonser, *J. Electrochem. Soc.*, 93, 258-64 (1948).



◀Tantalum

◀Interlayer

◀Iron

○ ○ ○
TANTALUM deposit on high purity iron. Deposition reaction was reduction of TaCl₅ with H₂, carried out for 30 min at 1830°F. 250X.
○ ○ ○

Refractory Metals

chamber linings, turbine blade coatings, valve linings, and heat exchanger and regenerator elements.

Where hard, erosion-resistant surfaces are required, as in linings for solid fuel injection and shot-blasting nozzles or on bearing surfaces, the carbides, nitrides and especially the borides of the refractory metals would be suitable coatings. Hardnesses obtainable approach that of diamond, but some of the materials are extremely brittle. Brittleness, with the exceptions of the ductile metals and semiductile silicides of tantalum and molybdenum, limits use to application on brittle bases or to forms not subject to appreciable deformation except, possibly, at higher temperatures where increased ductility sometimes obtains. In many instances, the loss in ductility will be compensated by the improved erosion or corrosion resistance given by the coating.

Vapor-deposition processes can be used to deposit coatings of the most refractory materials at temperatures far below the melting points of the materials or at temperatures at which the vapor pressures are negligible. Coatings varying from less than a micron to several millimeters in thickness can be formed in plating times varying from a few minutes to several hours. Most vapor-deposition processes can be carried out either in a vacuum or at atmospheric pressure.

Coatings deposited by chemical reaction at high temperatures are more apt to be adherent and stable under high-temperature operation than materials deposited at low temperatures (as by electrodeposition), which have a greater tendency to flake away when heated.

Selection of the coating material is governed by (1) melting point, (2) resistance to attack by

d Decomposes before melting.

* Under Pressure.

** The coating was too porous to prevent oxidation of the base although not oxidized itself.

¹ The melting points of the boride, silicide and carbide coatings will, in practice, vary widely since the pure compounds are rarely obtained.

² Ductility:

(1) Capable of being severely drawn, rolled or otherwise worked without failure.

(2) Capable of withstanding slight deformation or consisting of individually ductile crystals fragily bound together.

(3) Incapable of being worked; of glasslike brittleness.

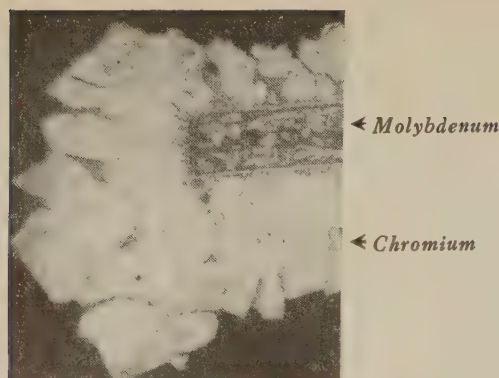
³ Oxidation resistance:

Classed according to the temperature range in which the rate of attack by air would cause severe erosion or failure of the coated specimen within a few hours. (1) above 3092° F, (2) 2552° to 3092° F, (3) 2012° to 2552° F, (4) 1472° to 2012° F, and (5) 932° to 1472° F. The oxidation rate also depends upon other factors, such as coat thickness and rate of air flow past the specimen, which have not been taken into account here.

TABLE I

Vapor-Deposited Refractory Coatings and Their Properties.

Deposit	Melting Point, °F ¹	Ductility ²	Oxidation Resistance ³
METALS			
Tungsten	6202°	2	4
Rhenium	5770°	1	4 to 5
Tantalum	5432°	1	5
Osmium	4892°	3	5
Molybdenum	4748°	2	5
Ruthenium	4532°	3	4 to 5
Iridium	4481°	2 to 3	4
Columbium	4411°	1	5
Tantalum-columbium alloy	4172°	1	5
Hafnium	3092° to 4046°	1	3
Rhodium	3603°	1	1
Chromium	3434°	2	2 to 3
Zirconium	3380°	1	3
Thorium	3328°	1	3 to 4
Platinum	3255°	1	1
Titanium	3169°	1	3
Vanadium	3092°	1	4
Uranium	2066°	1	5
Tantalum-titanium alloy		1	3
Tantalum-zirconium alloy		3	4
Chromium-molybdenum alloy			4
CARBIDES			
Tantalum carbide + hafnium carbide (4 TaC + 1 HfC)	7156°	3	3
Tantalum carbide + zirconium carbide (4 TaC + 1 ZrC)	7128°	3	3
Hafnium carbide (HfC)	7089°	3	3
Tantalum carbide (TaC)	7048°	2 to 3	3
Carbon	6418°	3	4
Zirconium carbide (ZrC)	6418°	3	3
Columbium carbide (CbC)	6364°	2 to 3	3
Titanium carbide (TiC)	5739°	3	3
Tungsten carbide (WC)	d5221°	3	5
Tungsten carbide (W ₂ C)	d5203°	3	5
Vanadium carbide (VC)	5149°	3	
Molybdenum carbide (MoC)	d4874°	3	5
Molybdenum carbide (Mo ₂ C)	d4897°	3	5
Boron carbide (B ₄ C, B ₆ C)	4262° to 4532°	3	3
Silicon carbide (SiC)	d3529°	3	2
Chromium carbide (Cr ₃ C ₂)	3434°	3	
NITRIDES			
Tantalum nitride (TaN)	5617°	3	5
Boron nitride (BN)	5432°*	3	3
Hafnium nitride (HfN)		3	
Zirconium nitride (ZrN)	5396°	3	3
Titanium nitride (TiN)	5365°	3	3
Vanadium nitride (VN)	d3722°	3	
Columbium nitride (CbN)	d3722°	3	5
Tantalum carbide + tantalum nitride (TaC + TaN)	6045°	2 to 3	3 to 5
BORIDES			
Hafnium boride	5572°	3	
Zirconium boride	5414°	3	2 to 3
Titanium boride		3	2 to 3
Tungsten boride	5288°	3	3 to 4
Boron	4172°	3	3
Tantalum boride	3632°	3	3
Molybdenum boride	3632°	3	3
Aluminum boride		3	3
Silicon boride		3	2 to 3
Vanadium boride	2372°?	3	3 to 4
Chromium boride		3	1 to 2
SILICIDES			
Titanium silicide	3632°	3	4
Zirconium silicide	3632°	3	4
Molybdenum silicide	> 3272°	2	1
Tungsten silicide			1 to 2
Columbium silicide		2	4
Tantalum silicide		1 to 2	3
Chromium silicide		3	1 to 2
Silicon	2588°	3	3
Chromium-molybdenum silicide			1 to 2
OXIDES			
Zirconium oxide (ZrO ₂)	4892°	3	1**
Aluminum oxide (Al ₂ O ₃)	3722°	3	1**
Aluminum oxide + zirconium oxide (Al ₂ O ₃ + ZrO ₂)	3632°	3	1**
Chromic oxide (Cr ₂ O ₃)	3614°	3	1**
Silicon dioxide (SiO ₂) (glassy)	3147°	3	1
Silicon dioxide (SiO ₂) on aluminum oxide (Al ₂ O ₃)		3	1**



CHRONIUM on molybdenum by the diiodide decomposition-in-vacuum method, 1 hr at 1830°F.

hot gases, (3) mechanical properties at both high and low temperatures, (4) cost of materials and labor involved in producing the coating, and (5) availability of the material.

Table I lists the potentially useful refractory materials which have been applied as coatings by vapor-deposition methods. Also listed are melting points and estimates of coating ductility and air-oxidation resistance.

Two general plating methods are used. The most common method is chemical reduction or reaction at the surface. In this class are hydrogen reduction of halides; reaction of halides with a gas containing C, N₂, B, Si or O₂; and displacement or reaction of the base material with one of

the constituents of the gas phase. The second method is thermal decomposition at the surface. This method applies, at high temperatures, to halides and oxygen-containing compounds, and, at low temperatures, to carbonyls and hydrides.

Most of these processes can be carried out in pyrex apparatus since the majority of the volatile compounds used develop the required vapor pressure below 1000°F, and the samples can usually be heated internally. The compounds of chromium and vanadium, however, are so non-volatile that these metals must be deposited in quartz, Vycor or porcelain apparatus. Specimens are best heated by induced high-frequency currents or by resistance heating.

In all the processes except some halide decompositions, the plating atmosphere is usually prepared outside the plating chamber. Relatively impure crude metals or carbides can be used as starting materials. Contaminants, chiefly O₂, N₂ and C, which do not form volatile compounds are left behind and a purified metal is deposited.

The vapor-phase coating processes cannot be considered as substitutes for the more conventional coating processes which are more economical and require less careful control. Vapor deposition can, however, supplement the usual processes for material not subject to treatment by more usual means, or for depositing coatings under conditions more similar to those under which the materials will be used.

Acid Pretreatment of Porcelain Enamel

THE effects of acid pretreatment of porcelain enamels on acid and abrasion resistance of the specimens are discussed in a recent report of the National Bureau of Standards. In the revision of the specification for enameled graduates for darkroom use, tests were made to compare the relative effects of hydrochloric, acetic and citric acids on a number of enamels. These tests indicated that acetic acid was much less corrosive than were hydrochloric and citric acids. The most significant finding, however, was that treatment with acetic acid, which produced only minor visible attack, strongly inhibited further attack when subsequently treated with citric acid, although the citric acid severely attacked the untreated areas of the same enameled specimens.

It was found that pretreatment with acetic acid in concentrations from 0.5 to 50 pct for periods of 5 min or longer, were effective against subsequent treatment with 10 pct citric acid.

Treatment with butyric acid for 15 min produced the same effect, but neither tartaric nor lactic acid was effective.

This passivation effect was explained in the report on the hypothesis that the acetic and butyric acids preferentially leach alkalies from the enamel surface, leaving behind a silica-rich film which is resistant to further solution even in citric or stronger acids. With citric acid, on the other hand, the attack apparently proceeds to a greater depth before sufficient thickness of this film is built up to inhibit further solution.

It was found that treatment for 15 min in 10 pct citric acid appreciably reduced the abrasion resistance of certain enamels having Class B or Class A acid resistance (PEI standard test), this effect being more pronounced on titanium-type enamels than on antimony-type enamels. In no case was the abrasion resistance of Class AA enamels affected.

New Production Ideas . . .

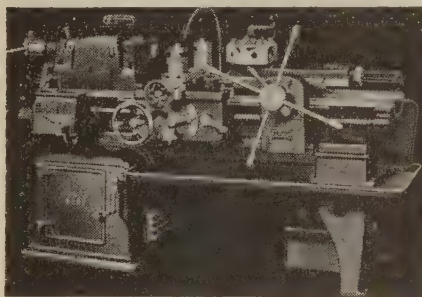
New and improved equipment described this week includes: Flat surface finishing machines, turret lathes, a hand screw machine, tube flaring machines, a continuous limit gage, tachometers, a delayed action control unit, crane scales, a carboy filter, steel storage bins and stacking boxes, welding goggles, impregnated salt tablets, and translucent battery plugs.

FINISHING of flat surfaces to close tolerances is possible on the new Microflat machines that are claimed to have made production setups practical in holding flatness to one light band, surface finish of less than 1 microinch rms, parallelism between two surfaces within 0.0001 in., and the development of a controlled functional surface. Hand lapping of mating surfaces for high or low pressure gas and liquid seals is no longer necessary. Generating flatness with the correct functional surface finish has eliminated the use of gaskets in many seals. This flat and functional finish is not only readily generated but these results are consistently duplicated on every part. By finishing both surfaces simultaneously, parallelism between two surfaces is generated to very close limits. Microflat machines use

machine finishes two parallel surfaces simultaneously with plates to 44 in. diam. *Micromatic Hone Corp. For more information, check No. 1 on the attached postcard.*

Precision Turret Lathe

IMPROVEMENTS in the South Bend No. 2-H precision turret lathe include a turret locking mechanism that will index the turret



head within ± 0.0005 in. measured 4 in. from the turret face. Designed for the production of duplicate parts, the lathe can be equipped with universal chuck or independent chuck for machining castings, forgings, etc., or it can be equipped with handlever draw-in collet attachment for machining bar stock or tubing. Maximum swing over the bed is $16\frac{1}{4}$ in., over the cross slide $6\frac{7}{8}$ in. Maximum collet capacity is 1 in. round and spindle hole is $1\frac{3}{8}$ in. The hexagon turret has $1\frac{1}{2}$ in. diam holes for turret tools. Clearance from center of tool hole to top of turret slide is $2\frac{1}{2}$ in. The effective feed of the turret slide is $6\frac{1}{8}$ in. The universal carriage has friction clutch drive for 48 powered cross-feeds ranging from 0.0006 to 0.0312 in.; 48 powered longitudinal feeds ranging from 0.0015 to 0.0841 in.; and lead screw and split nut for cutting 48 pitches of screw threads ranging from 4 to 224 per in. All changes for threads and feeds are made through the quick

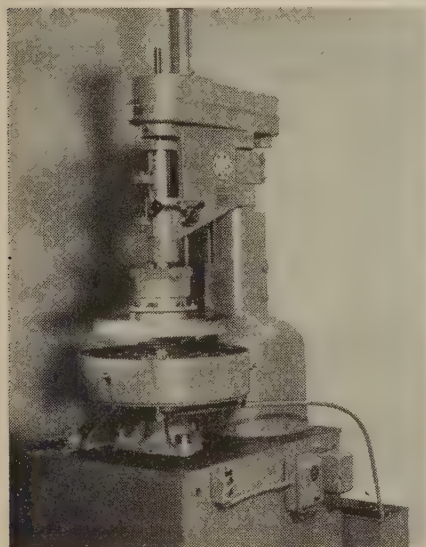
change gear box. The ram-type hexagon turret has power and hand feed, with an adjustable feed trip and stop for each of the six turret faces. Twelve spindle speeds range from 16 to 880 rpm. *South Bend Lathe Works. For more information, check No. 2 on the attached postcard.*

Hand Screw Machine

MACHINING 10 to 20 pieces per min is possible on a vertical hand chucking machine designed principally for secondary operations on screw machine products. The design of the chuck permits the chucking and release of parts to be machined while the spindle is rotating or stationary. This is accomplished by raising the spindle through a reverse motion of the feed lever operated by



the operator. The machine is best adapted to long slender work as the work to be machined is supported by a bushing. Accuracy of turning is possible because the turning tools are set just below the work-supporting bushing and there can be no



loose or bonded abrasives. Any material from soft bronze to tungsten carbide, glass, quartz or nitro-alloy can be processed. A small machine has a capacity for a 14-in. diam finishing plate; a large double

springing of the work by pressure of the tool. Cutting tools, bushing and workpieces are submerged in a bath of coolant when the work is being performed, permitting higher than usual spindle speeds. Tolerances of ± 0.001 in. on diam and ± 0.002 in. on length are easily held. This machine, made for work ranging from $1/16$ to $3/8$ in. diam and from $1\frac{1}{2}$ to 8 in. long, can be adapted to turning, drilling, reaming, tapping, threading, boring and form turning and can also be used as on primary operations for small runs. *Champlain Motors, Inc.* For more information, check No. 3 on the attached postcard.

Tube Flaring Machine

A NEW Tubemaster has been developed for flaring, flanging, squaring and burring, either ferrous or nonferrous tubing, $1/8$ to 5 in. diam. A 2 hp motor and variable speed drive gives a range of 70 to



550 rpm for handling various materials. Adapters are furnished so that present users of the smaller capacity machine may utilize their present tools and dies. *Leonard Precision Products Co.* For more information, check No. 4 on the attached postcard.

Improved Electrodes

IMPROVEMENT in performance of swivel-type resistance welding electrodes has been accomplished by drilling the water hole completely through the shank, bringing cooling water directly in contact with the swivel head. Tests indicate a stabilized operating temperature of 201°F for the new unit, compared with 630°F for the earlier design. This reduction is

said to materially increase the life of the swivel tip and enable it to produce sounder welds of a higher strength. *P. R. Mallory & Co., Inc.* For more information, check No. 5 on the attached postcard.

Polishing Machines

NEW buffing and polishing machines designed to provide greater movement for polishing large areas are available in single, four and eight spindle units. The head is swivelled automatically by depressing a foot lever. Movements at right angles are accomplished by two hand wheels. Range of vertical adjustments has been increased and



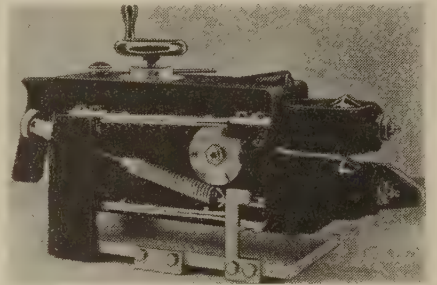
an automatic oscillating movement up to 6 in. is available. Chucks for holding parts to be polished may be designed to specifications. Spindle speed on the single spindle machine is 24 rpm. *Vanott Machine Corp.* For more information, check No. 6 on the attached postcard.

Cast Iron Filler

A HANDY cast iron filler Economizer is a product designed for use by tradesmen, mechanics and repairmen as a solder for ferrous and nonferrous work, except aluminum. The unit contains a roll of Eutec-Cast Iron-Filler and a jar of Eutector Flux both packaged in one container. The alloy feeds through a hole in the top of the container and the flux is placed in the bottom. The filler can bond on extremely rusty, old metal. Its bonding temperature is 500°F . *Eutectic Welding Alloys Corp.* For more information, check No. 7 on the attached postcard.

Continuous Limit Gage

TO protect metal stamping dies from being injured by material that is too thick, a new Continuous Limit Gage controls or indicates by a signal light, control relay, or the like, when the strip or sheet material is too heavy. This gage does not show the thickness of the material or the amount of variation but indicates when the



material is either light or heavy, not both. When used with a stamping press or similar machine, the gage will send out a signal or impulse that will stop the operation before the off-gage material reaches the die. Also this gage provides a means of inspecting continuous strip material where it is desired to control only one limit, high or low. The range of the gage is from 0 to 0.003 in. with an accuracy of 0.0005 in. It is set by means of precision gage blocks and by turning the hand wheel until the setting light is on or just ready to come on. *Pratt & Whitney, Div. of Niles-Bement-Pond Co.* For more information, check No. 8 on the attached postcard.

Pre-lubricated Sleeve Bearing

A NEW pre-lubricated sleeve bearing features a means of compensating for both parallel and angular misalignment, reduces transmission of noise and provides for shock absorption. Known as

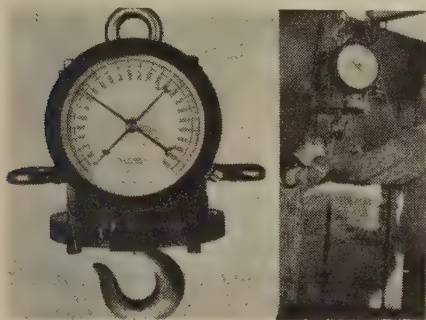


Silent-Lign, the new pillow block has an Oilite bearing that is enclosed in a bushing or shell of Neoprene, the latter being contained in a base of stamped, welded steel. Installation time is reduced

because of the automatic compensation for any type of misalignment. The mounting for the entire assembly is cadmium plated steel. It is available in smaller shaft sizes up to $\frac{1}{4}$ in. diam. *Bushings, Inc.* For more information, check No. 9 on the attached postcard.

Hydraulic Crane Scales

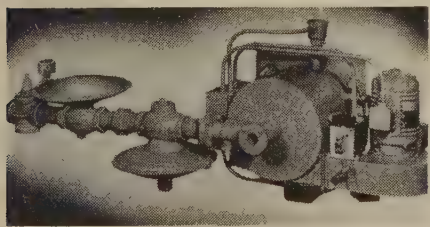
DESIGNED primarily for measurement of loads as they are handled by a crane, yet easily



adaptable to other force and/or load-measuring applications, hydraulic crane scales are available in load capacities ranging from 0-1000 lb to 0-30,000 lb. The basic feature is a hydraulic cell that converts force into corresponding fluid pressure that is connected to a pressure indicator, calibrated to read in pounds of load on the scale. The complete crane scale measures from 22 to 36 in. in overall height, depending on the model. The hook and eyebolt are swivel mounted. Dial sizes are $8\frac{1}{2}$, 12 and 16 in. diam. *A. H. Emery Co.* For more information, check No. 10 on the attached postcard.

Boiler Burner

ASELF-CONTAINED boiler gas burner, Series 115, for old or new boiler settings is made in two sizes, the 115-2.5 for 2.5 million Btu input and the 115-5 for 5 mil-

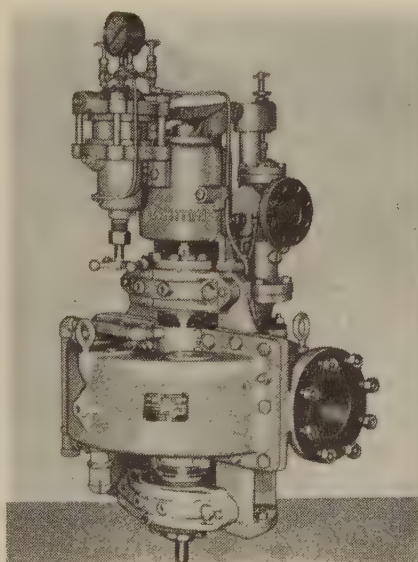


lion Btu input. Combustion is furnished through the burner by a blower, which is an integral part of the burner for complete fuel-air ratio control and to assure maximum heat output of fuel. Install-

tion is said to be simple with one gas line and marked wiring. Operation is claimed to be quiet with little servicing required. *North American Mfg. Co.* For more information, check No. 11 on the attached postcard.

Vertical Turbine

TO drive centrifugal pumps and other vertical units, a small, compact, rugged vertical steam turbine is capable of developing horsepower ratings up to 90 bhp. The turbine is available in semisteel or cast steel to meet the requirements of practically any steam pressures and temperatures. The standard machine can take thrust loads in



either direction up to approximately 1500 lb and can be changed to take even higher loads. This vertical turbine is equipped with both constant speed and emergency governors. Pump governors can be built into the machine. *Whitton Machine Co.* For more information, check No. 12 on the attached postcard.

Tool Balancer

ELIMINATION of lost motion and increased production by having tools in a position for instant application are advantages of the new tool balancer that balances a tool left in any position in the balancing range without any up or down creep. It can be moved up or down with the slightest pressure. The balancer hangs from a fixed point, or is equipped to operate on a standard 4 or 6-in. I beam, Cleveland tram-rail or American Mono-rail. The unit swivels vertically from 0° to 17° and will rotate 360° .

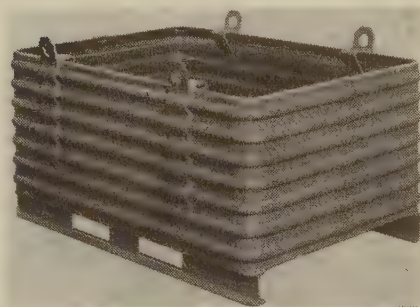
It has a conduit tube to support an inlet hydraulic hose or electric cable to the portable tool being balanced. A safety latch holds the balanced tool at the top of the balancing range when production line is down or when the air is shut off. The balancer is manufactured in 36 and 42 in. balancing ranges, balancing tools that weigh from 10 to 500 lb. It operates on 100 lb air line pressure. *Platz Co.* For more information, check No. 13 on the attached postcard.

Monel Tie Wire

A NEW and lighter tie wire, made of corrosion-resistant Monel metal, is 0.015 in. diam, yet in strength tests is said to have proved superior to heavier wires. It is easier to work than ordinary tie wire. Under continued exposure such as fastening neon glass tubes to signs, it has shown no indication of rusting, nor has any sign been discolored or streaked by the wire. *Metal Goods Corp.* For more information, check No. 14 on the attached postcard.

Steel Stacking Box

NEW corrugated all-steel welded stacking boxes with four-way entrance have corrugated bottoms. Crane lugs, stacking brackets and

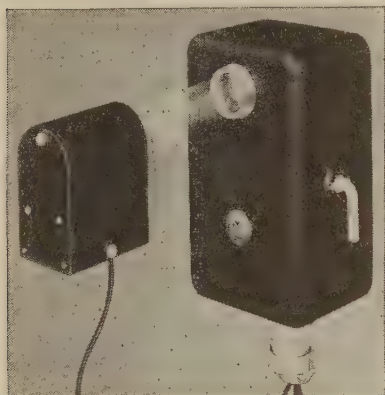


channel runners are optional, according to customer specifications. The boxes are built to required dimensions, including underneath clearance. Load capacity, and color of paint desired, may also be specified. *Palmer-Shile Co.* For more information, check No. 15 on the attached postcard.

Delayed Action Control Unit

JAMMING of cases or cartons on conveyer lines in package-handling industries are indicated with the new delayed action photoelectric control type 20DA4. Control and light source of the instrument are placed on opposite sides of the conveyer so that when a case passes

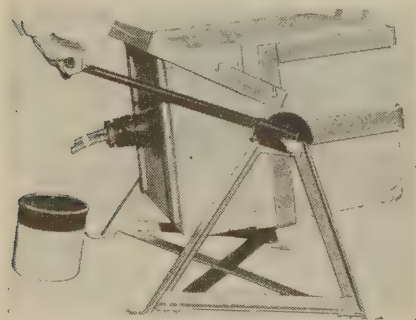
along the conveyer it will interrupt the light beam. Delayed action in the photoelectric control occurs only when the light beam has been interrupted for a predetermined



time interval. Excessive light beam interruption can be caused only by the jamming of several adjacent cases. Stop motion control of the feeder conveyers then prevents additional cases from entering the main conveyer line. The delayed action interval is adjustable from 1/20 to 5 sec. The entire unit is designed for plug-in construction of all electrical connections. Operating range is 10 ft. *Photoswitch Inc.* For more information, check No. 16 on the attached postcard.

Carboy Tilter

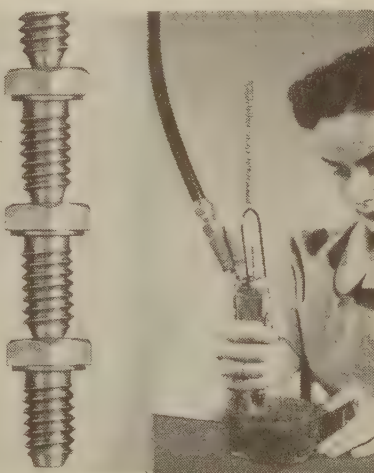
DRAINING acids and other liquids from carboys is facilitated by the new safety carboy tilter that fits carboys of any size.



The cradle and supporting base are made of structural steel and all members are riveted or welded to insure a strong, durable unit. The locking device permits the carboy to be held at any angle for pouring. An air vent pouring spout, made of acid resistant rubber and plastic tubing, insures an even flow of acid without spurts or splashes. Flow capacity is 5 gpm. *General Scientific Equipment Co.* For more information, check No. 17 on the attached postcard.

Screw Sticks

USED in pneumatic, electric spiral or hand-ratchet drivers, a one-piece stick of identical small screws, known as Screwstick, makes fastening faster, simpler, more efficient. Constant measured torque provides uniform tightening. Screws are twisted off automatically and the fastening made when a predetermined torque is reached. As the tightened screw is freed from the neck, the next screw in line is automatically advanced. The amount of torque is controlled by cross-sectional area of the neck joining the screws. The head of the driven screw is burnished smooth by the next screw to be driven. Screwsticks are available in Nos.



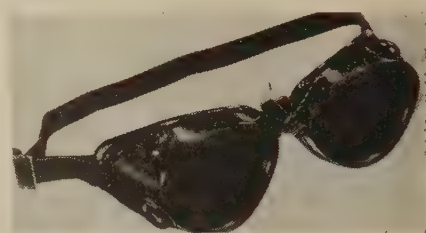
0, 1, 2, 3, 4, and 5 diam in mild steel, brass and aluminum. *American Screw Co.* For more information, check No. 18 on the attached postcard.

Wire Terminal Kit

A NEW solderless wire terminal kit contains a complete assortment of the most popular solderless wire terminals and insulation tubing and a crimping and cutting tool. Lynn Lightning solderless terminals require no solder, no complicated equipment, and no special skill. The crimping tool operates like a plier and crimps the terminal to the wire with a single vise-like crimp. The tool also can be used to cut and strip all wire from 10 to 22 gage. Items are packed in 11 separate compartments in a plastic box. Individual identification tabs give complete stock and size identification. *Lynn Products Co.* For more information, check No. 19 on the attached postcard.

Welding Goggle

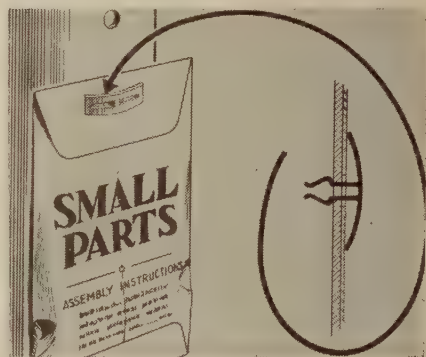
MORE strength and less weight are features of a new welding goggle with cups of DuPont nylon plastic. Rolled edges reduce pressure around the eye socket. Adjustable leather bridge and head-



band assure perfect fit. Triangular lenses provide extra wide vision and screened indirect ventilating ports admit sufficient air to prevent fogging, but keep out dust and flying particles. The goggle is also available with direct ventilating ports and clear, impact-resisting lenses for chipping and other heavy duty work. *Willson Products, Inc.* For more information, check No. 20 on the attached postcard.

Speed Clip

A SPEED clip has been manufactured to attach paper envelopes of fasteners and small parts to metal products that are shipped as knocked-down assemblies. The fasteners are placed in a sturdy paper envelope and the envelope is attached to the assembly with the



speed clip that snaps into place quickly. *Tinnerman Products, Inc.* For more information, check No. 21 on the attached postcard.

Tachometer

TYPE 48K tachometer is designed with ranges especially suited for motor and generator testing. Total speed range without adapters is 360 to 4000 rpm for accommodating all synchronous or induction motors and most geared

types. High accuracy, said to be guaranteed on all ranges to within $\frac{1}{4}$ pct of actual speed, is obtained by the use of a bridge circuit principle. Circuit is self-calibrating. Damage is claimed not to result from overspeeding up to about 8000 rpm regardless of range setting. Any one of the ten ranges is selected by a rotary switch. Lubrication is permanent and operation is low-torque for increased life. *Metron Instrument Co. For more information, check No. 22 on the attached postcard.*

Impregnated Salt Tablets

A SLOW dissolving salt tablet that releases some salt immediately after taking, but not enough to cause stomach distress or nausea, has been developed. These Pep-Up tablets are subjected to a process that forms a complete coating around each grain of salt in each tablet. They are said to withstand high temperatures and humidity of tropical climates, as well as the friction and impact of handling. They will not absorb moisture from the air and clog dispensers. The tablets are packaged in a sturdy container of inexpensive material, with a built-in dispensing unit. The entire container can be attached to the wall. *U. S. Safety Service Co. For more information, check No. 23 on the attached postcard.*

Storage Bins

A N all-welded steel Flexi-Bin fits the need of most parts storage situations and is assembled without use of nuts or bolts. One unit is based upon an assembly of back, sides, top and bottom, measuring 36x84x12 in. Shelves slide in place on $1\frac{1}{2}$ in. centers; sloping shelf dividers in four heights between $1\frac{1}{8}$ and $6\frac{1}{8}$ in. snap into place at desired widths; sloping front trays are available to assemble 4, 6 or 9 to a shelf and dividers for trays slide into place on 2-in. centers. Label holders snap on front of shelves and trays. *Borroughs Mfg. Co. For more information, check No. 24 on the attached postcard.*

Reversible Ratchet Wrench

D ESIGNED so that strain or load is applied to the wrench so that all working parts are in compression, a heavy duty ratchet wrench applies total leverage ex-

erted through the handle to the work to eliminate danger of pawl breakage. Construction also features a synthetic rubber ring to retain the socket in position. Pawl, which permits quick reversal of wrench direction, is of one piece design and has been built into and bolted through the handle. Double head design permits each head to have two sizes of openings. It is available in 15, 24 and 27 in. handles, and sockets for nuts from $\frac{1}{4}$ to $1\frac{1}{2}$ in. bolt size. *Greene, Tweed & Co. For more information, check No. 25 on the attached postcard.*

Translucent Battery Plug

W HETHER a battery needs water can be told at a glance with new translucent plastic vent plugs, named the Telelevel. The translucent plug has a cylindrical element that projects down into the electrolyte. The portion of the element that extends into the electrolyte is cone-shaped. When the electrolyte is at correct level, the cone is completely covered. Light waves traveling down the element are absorbed into the electrolyte and not reflected, so that the top of the plug shows a black circle, indicating that no water is required.

When the electrolyte is low the light waves are reflected back up the element and a white circle appears, indicating that water is required. *Gould Storage Battery Corp. For more information, check No. 26 on the attached postcard.*

Dry Chemical Extinguisher

E XPULSION of a fine white powder onto the blaze is the principle of a new dry chemical extinguisher. The heat of the fire releases carbon dioxide gas from the powder, and this cools and smothers the blaze. A small carbon dioxide cylinder furnishes the impelling force that delivers the powder in a 25-ft stream to the fire. This cylinder is contained inside the extinguisher shell. When the extinguisher is used, this cylinder is punctured by squeezing a valve mounted on the top of the extinguisher. A second valve attached to a flexible hose from the base directs and controls the flow of the extinguishing agent. The extinguisher is approved by Underwriters' Laboratories. *General Detroit Corp. For more information, check No. 27 on the attached postcard.*

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Information Free . . .

CAR SHAKER for unloading granular material from drop-bottom gondola cars is illustrated in bulletin 07B7221 and all engineering features are identified. Specifications are included as well as drawings. Included in applications listed are power houses, steel mills, coke plants, ore unloading stations, foundries and slag product manufacturers. *Allis Chalmers.* For more information, check No. 28 on the attached postcard.

BEARING BRONZE, die-cast by a method which is claimed to produce a more homogeneous structure which is stronger and withstands greater strains, is featured in leaflet. All sizes up to 16 in. OD and 20 in. long are listed in table. Microphotos show difference between this and ordinary bronze. *Magnolia Metal Co.* For more information, check No. 29 on the attached postcard.

PORTABLE CONVEYORS in several models are pictured in bulletin No. 149. Main features are listed as hydraulically operated boom hoist, self-aligning bearings, rigid reach members, wrap drive, sectional construction, welded flights and easy convertibility. Features are emphasized in sectional photographs. Several complete models are shown. *Fairfield Engineering Co.* For more information, check No. 30 on the attached postcard.

PRE-FINISHED ALUMINUM, nickel and chrome plated in sheet form, is discussed in folder. Two samples are attached, one of chrome aluminum (bright) and one of nickel aluminum (satin). This material is available in sheets up to 36x96 in. in gages from 0.010 to 0.081 in. in various tempers. It is also offered in pattern designs. *American Nickeloid Co.* For more information, check No. 31 on the attached postcard.

BRAZING SETUPS, equipment and fluxes to speed production are discussed in bulletin No. 46. Case histories are given including one explaining how output of immersion type electric water heater production was stepped up 300 pct with a foot operated device. Several setups are shown. *Handy & Harman Co.* For more information, check No. 32 on the attached postcard.

ANCHORING DEVICES for use in masonry listed in catalog No. 60 include expansion shields and anchors, toggle bolts, carbide masonry drills, star or stone drills, drill points, bull points and small turnbuckles. Some types of these devices are made of a rustproof, non-ferrous metal which is pressure cast into shape for lifetime service. *Expansion Bolt Co.* For more information, check No. 33 on the attached postcard.

GOGGLE VALVES of special design for shutting off large diameter gas mains are the subject of a catalog which stresses latest improvements and contains detailed drawings. Particular emphasis is placed on a new type bellows valve which performs the same function as a goggle valve. *Edgar E. Brosius Co., Inc.* For more information, check No. 34 on the attached postcard.

COATING PROCESS for use in mild steel spray type washing machines is explained in folder with cleaning and phosphatizing in washer systems with from two to six stages described. Data on salt fog spray tests is included to show greater durability and superior adhesion of paint. Recommended for steel, aluminum or both. *Neilson Chemical Co.* For more information, check No. 35 on the attached postcard.

BEARING SURFACES folder describes a film report on the generation of metallic bearing surfaces and analyzes methods used in generating them. Twenty scenes are shown with a full description of each. The story explains the importance of honing to provide good surface structure and surface finish. *Micromatic Hone Corp.* For more information, check No. 36 on the attached postcard.

ROOF INSULATION. Some outstanding installations of Fiberglas roof insulation proved in use are pictured in catalog. Photographs illustrate some plants and also show the insulation in the process of being installed. Various buildings over the country which have this insulation are listed. *Owens-Corning Fiberglas Corp.* For more information, check No. 37 on the attached postcard.

VALVE SELECTOR is available to enable users to order valves more easily and lists code numbers for over 35,000 standard valves. A price calculator is also available. Knob, lever, foot, cam, treadle, cylinder, diaphragm, tandem operated, and solenoid valves which can be made to fit customer's application are included. *Valvair Corp.* For more information, check No. 38 on the attached postcard.

GRINDING WHEEL booklet contains a non-technical discussion of established rules governing safe operating speeds and explains why maximum operating speed recommended by the wheel manufacturer should not be exceeded. This booklet has been prepared for operators, supervisors and safety engineers. *Grinding Wheel Institute.* For more information, check No. 39 on the attached postcard.

FILTER CLOTH folder describes new resistance to chemical corrosion. How it cuts losses due to acids over a range of temperatures and concentrations is explained. Various types of equipment in which it is used is shown. Information in table form shows resistance of the filter cloth to corrosive media. *John A. Roebling's Sons Co.* For more information, check No. 40 on the attached postcard.

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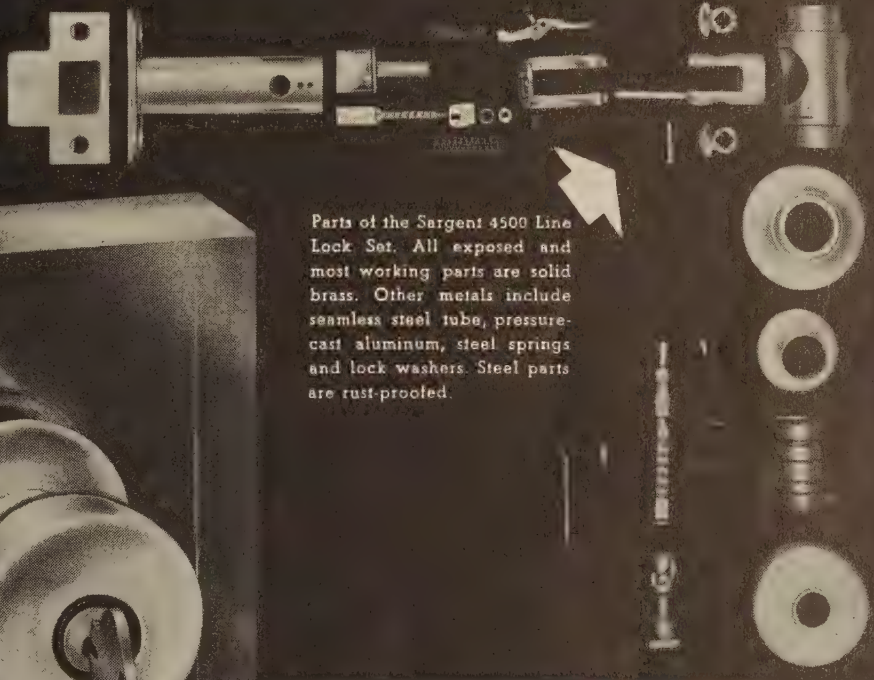
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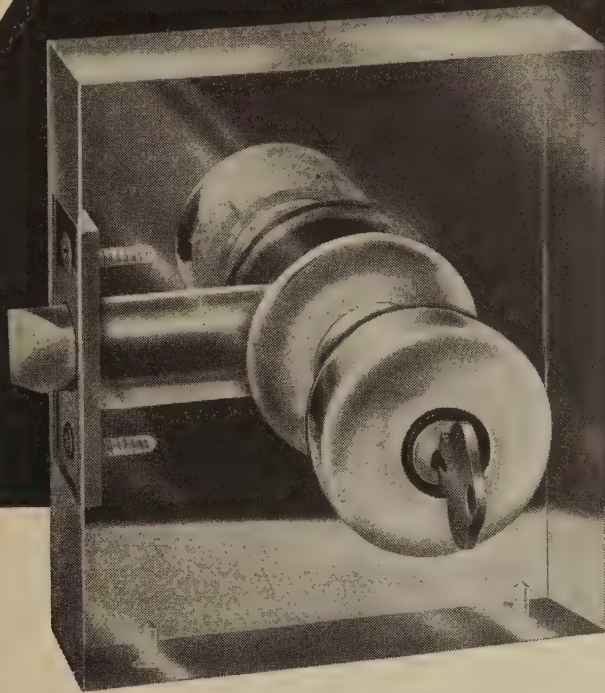
CITY ZONE..... STATE.....

Solid Brass combined with steel and aluminum in this quality lock set

Sargent Pin Tumbler Door Lock, in the 4500 Line of Precision-Built Lock Sets. Includes locking button in center of inside knob, and automatic deadlock. Made by Sargent & Company, New Haven, Conn.



Parts of the Sargent 4500 Line Lock Set. All exposed and most working parts are solid brass. Other metals include seamless steel tube, pressure-cast aluminum, steel springs and lock washers. Steel parts are rust-proofed.



It is a fixed policy of Revere, expressed through its Technical Advisory Service, to recommend the most suitable materials for each application, whether or not supplied by Revere. An outstanding example of this practice is to be seen in the Sargent 4500 line of Precision-Built Lock Sets, a new line of exceptional beauty, security, convenience and long life. Revere and Sargent collaborated closely on this and other Sargent products.

The lock sets have a number of important advantages. One is the self-aligning feature; there is an aligning tube of pressure-cast aluminum which

makes it independent of the door for proper functioning. The case is a seamless steel tube, copper brazed to the front support plate. The solid brass lock mechanism has been simplified to achieve a small cross bore, permitting gracefully-designed knobs and roses in the proper proportions. The roses, incidentally, are applied without the usual screws, and there is no set screw in the knob. A new principle permits the knobs to project the same distance on each side, regardless of door thickness. The lock set is available in five different functions, each requiring the same size holes in the door, for the

economy of standardized installation.

All exposed parts are brass as are many of the other parts—solid brass, the quality metal that assures permanent service and good looks in hardware. Revere is proud to be an important supplier of fine brass in the hardware industry, as well as to manufacturers generally... The Technical Advisory Service is always at your service, ready to give unbiased suggestions on materials, design and fabrication.

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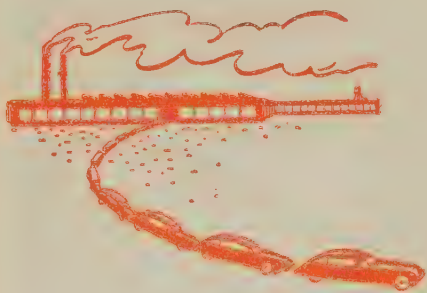
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WALTER G. PATTON

- Economic and competitive developments emphasize the value of automotive research . . .
- "Research successes" with deserved attention . . .
- Production rate of autos hits an all-time high in first half of 1949.



FRENCH LICK, IND.—It is difficult to escape the conclusion that auto engineers are currently engaged in research and development work on a broader scale than at any time in the industry's history.

This is not a trend that merely follows the growing acceptance of research. Rather, it is a trend that has recently been intensified both by economic and competitive conditions.

The auto industry has always had a large number of research projects in its laboratories. GM has been most prolific in this respect, followed closely by Chrysler. Ford research efforts have been strongly pushed under the new regime. So far as they have been able to do so, independents like Hudson, Nash and Kaiser-Frazer have attempted to follow the pace set by the major car manufacturers.

It is routine practice for every automobile manufacturer continually to investigate such things as engines, fuels, lubrication, springs, chassis and body design. Such investigations, together with con-

stant inquiries into better processing methods, improved design from a manufacturing standpoint and better materials handling are routine subjects for investigation.

During the last 6 months the research effort of practically all car producers has been intensified, principally because of the return of competition to the automobile industry. GM with its high compression engine and automatic transmission has temporarily, at least, outdistanced its competition and indications are that GM may have other tricks up its ample research sleeve.

As independent manufacturers will frankly admit, one of the discouraging things about trying to compete with General Motors is that the latter has all the advantages of "big business" yet it appears to have few of the weaknesses often associated with large organizations—slow moving, top-heavy organization, etc. If anything, GM often gives the impression that it is able to move as fast as anyone in the industry. This has been the case with high compression engines and automatic transmissions.

At the moment, GM is getting a larger percentage of the industry's business than at any time in its history. What worries its competitors is that many of the advantages GM now enjoys may become even greater as the GM research and process development efforts become better organized.

THIS week Packard became the first GM competitor to come out with the technical details of an automatic transmission that will challenge GM's Hydra-Matic and Dynaflo. The new Packard design was deservedly applauded. Most engineers agree Packard has done an excellent job. However, in the next breath they will also agree that the automatic transmission has a long way to go before it becomes a perfected mechanism. The new Borg-Warner transmission, recently adopted by Studebaker will, for instance, have fea-

tures not incorporated in the Packard design. As in the case of the Packard transmission, the B-W design stresses improved economy and greater control by the driver.

Most auto engineers agree that the next several years will see important new refinement in transmission designs; more attention will undoubtedly be given to design features that will both improve the efficiency of the equipment and permit manufacture at decreased cost.

One of the curious things about the present automatic transmission development is that while the ordinary driver—particularly a learner or a woman driver—may want everything to be fully automatic, another driver—particularly those who pride themselves on their knowledge of cars—are insistent on bringing automatic transmission operation more fully under the driver's control. It is perfectly obvious that combining all these features into one fool-proof mechanism will, as the English say, "take some doing." Particularly if the device must be capable of thinking for the driver as well as responding to what the driver happens to be thinking.

Automatic transmissions already cost several times as much to build as the standard synchro-mesh transmission. It is undoubtedly true that the cost of building fully automatic transmissions of the present design and in the present volume costs more than it does to build a car engine. While this condition may not continue indefinitely, the situation is not expected to be corrected immediately or in the near future. Despite advantages to car owners, high cost continues to be one of the most formidable obstacles in front of the automatic transmission development.

THE growing importance of organized research and development is emphasized further by taking a look at the record of the auto industry's "research successes" in recent years. As A. F. Underwood of GM's Research Development

WHEN THE

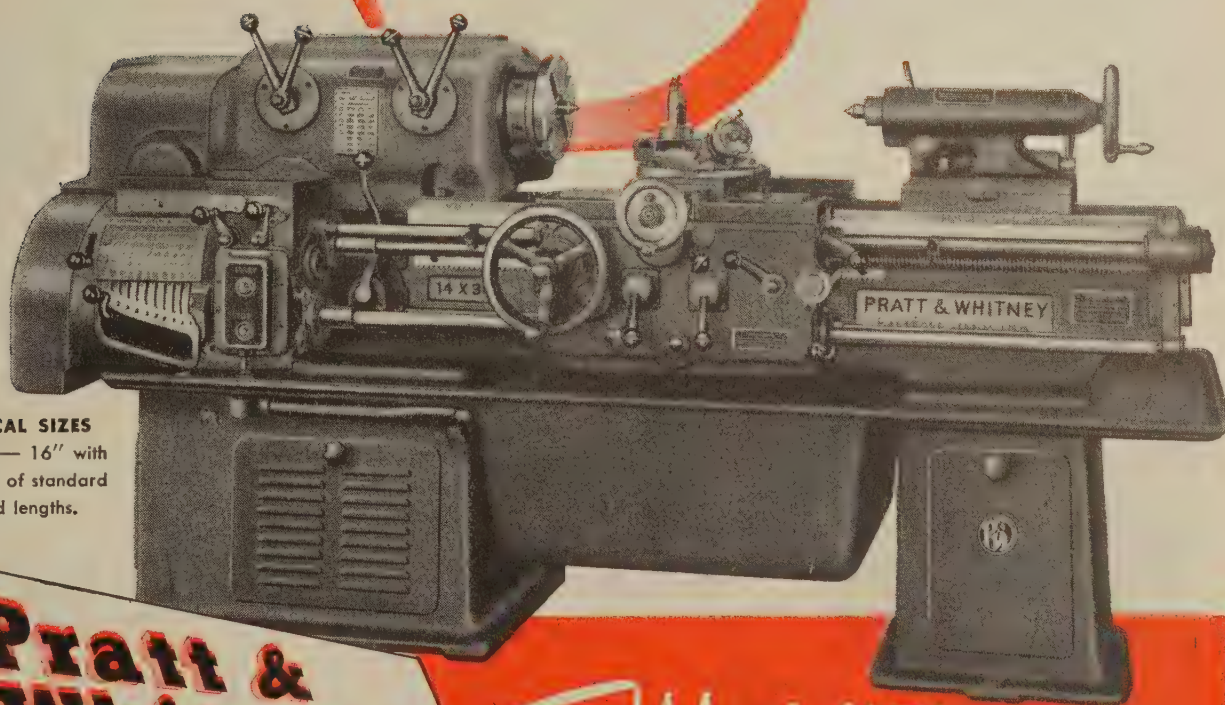
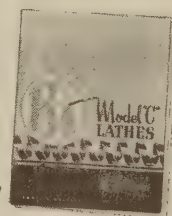
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Laboratories pointed out here this week, there were three connecting rod failures but no direct bearing failures in the 1949 Indianapolis race. A few years ago, bearing trouble was probably the most common type of failure at the Indianapolis track. The new bearing materials which have practically eliminated bearing failures from motor-ing have been developed for the most part in the laboratories of this country, Mr. Underwood pointed out.

Investigation will also show, he said, that machine testing in the laboratory, while never a substitute for field test work, has made many important contributions to auto engineering in recent years. An outstanding example was the development in the GM laboratories of a satisfactory connecting rod for the Allison engine during the war. Rod failures were occurring regularly and GM laboratory technicians were called in. In a comparatively short time, fatigue testing machines were designed and built that were able to duplicate almost exactly in the laboratory the type of failure that was being experienced regularly in the field. A change in design of the connecting rod was quickly tested in the laboratory. This design later proved satisfactory in service. Diesel pis-

tons of a radical new design and many of the parts of the new GM high compression engine were originally tested in the GM laboratories.

Auto engineers are nowadays insisting wherever possible on tests of entire parts and even entire assemblies rather than the previous method of testing material samples. This is particularly true in the case of fatigue testing where new and complex machines have largely replaced the small rotating type Moore machines that were formerly used.

AUTO engineers are quick to explain, however, that at the present time laboratory testing, while satisfactory for many purposes, often leaves much to be desired. This is particularly true in the case of wear testing where it is admittedly difficult, if not impossible, to duplicate the conditions experienced in the field. Factors like dirt, temperature and corrosion, etc., it is pointed out, may not duplicate service experience even if loads can be accurately reproduced.

It is also generally agreed that accelerated tests may be misleading, if not impractical.

Thus, while auto engineers do not expect to find a fully satisfactory

answer to their engineering problems in the laboratory, they have made tremendous progress in recent years in developing tests that will separate the obviously bad materials and designs from the promising materials and designs. With the field thus narrowed down, it has been possible to advance much more rapidly from a technical standpoint than would ever have been possible before the development of modern research methods.

Although sales of heavy trucks are off sharply at the moment some producers like Chevrolet with a comparatively large volume in the light truck classification are near their all-time sales mark. T. H. Keating, general sales manager of Chevrolet, has recently announced that up to June 1, Chevrolet dealers have sold at retail 148,624 trucks compared with 138,922 trucks sold during the first 5 months a year ago.

However, it should be pointed out, that Chevrolet is probably the most marked exception in the truck field. As a matter of fact, truck dealers have already openly protested to manufacturers that in some instances the manufacturers have asked them to sell too many heavy-duty vehicles. According to the protesting dealers, the practice has threatened the financial stability of even larger truck distributors.

CAR DOCTOR: Your service station attendant now uses a stethoscope on your car. Shown in the photograph is W. F. Phillips, manager of Studebaker's factory service school in South Bend, Ind. The long probe rod at the end of the instrument is merely touched against the engine and moved from point to point while the user listens for any amplified discords.



Auto Production Rate Hits All-Time High

Detroit

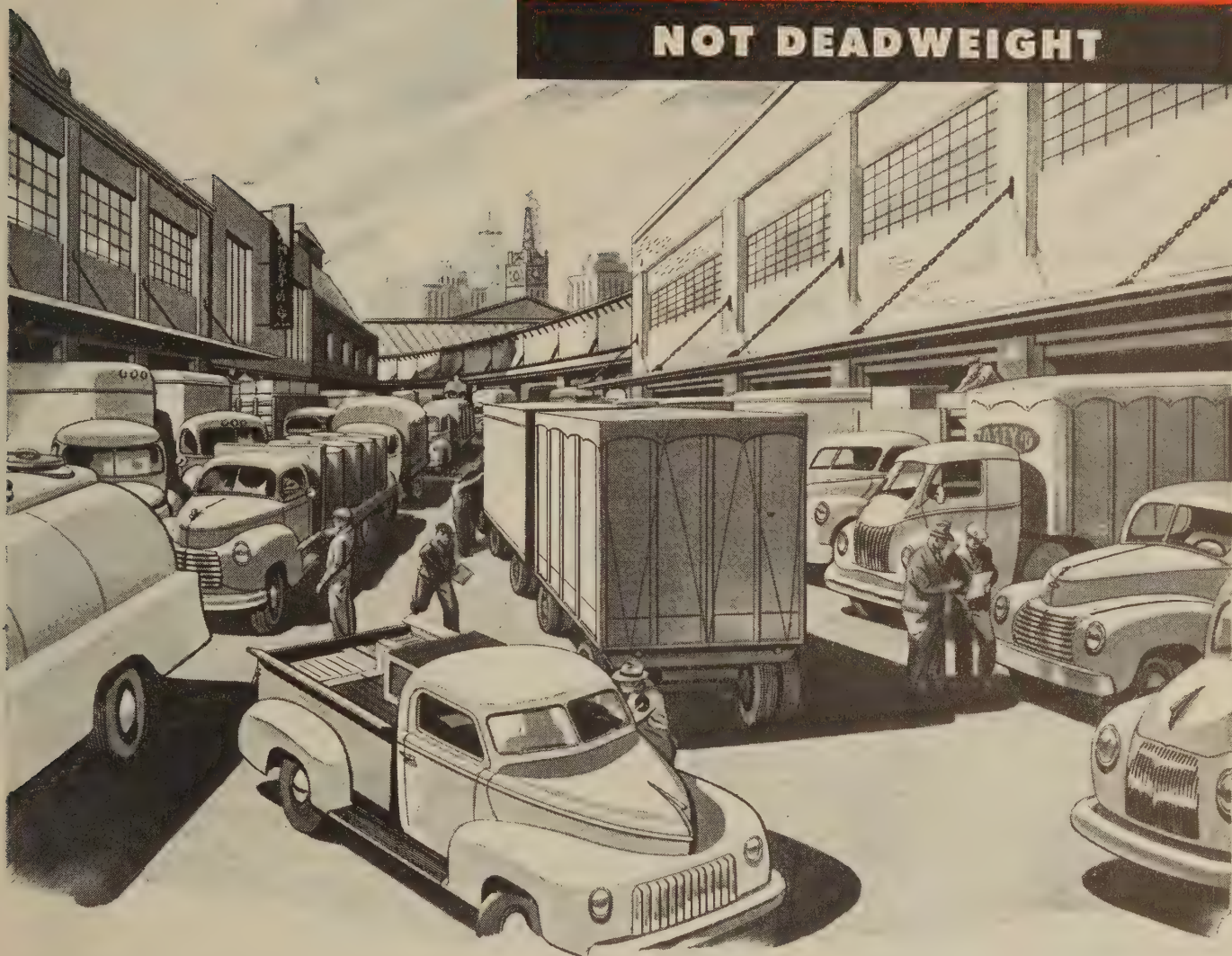
••• When all figures are recorded, the industry total for the first half of 1949 may come reasonably close to 3 million units, according to an estimate prepared by Ward's Reports. This is an increase of 455,000 over the 1948 output. If the first half production rate could be continued throughout the year the total would be greater than the 5,621,715 established in 1929, Ward's said.

There may be a slight upturn in production during the next few weeks, Ward's pointed out. All plants will be working 5-day schedules and Ford and Kaiser-Frazer production rates are expected to be increased sharply.

The prospects for a new high total for Chrysler during June is excellent, the agency pointed out.

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• House expected to approve delivered price bill . . . Additional steel mills for Texas brings opposition from Mr. Patman . . . FTC staff members still grumbling.



WASHINGTON—While it appears almost certain that the House will approve legislation affirming the legality of freight absorption and delivered prices, as has already been done by the Senate, Representative Wright Patman, D., Tex., is continuing his rear-guard action against legislation of this type.

Mr. Patman has for many weeks been conducting a one-man, below-the-belt campaign against such legislation in the pages of the Congressional Record. He has also been using the House Small Business Committee as a platform for his campaign to construct additional steel capacity in his own district in east Texas. Passage of delivered price legislation which would result in competitive selling of steel throughout the country would just about kill his fight for government aid for the construction of steel mills in east Texas.

A vigorous antimonopolist and self-acclaimed protector of small business, Mr. Patman is apparently not averse to a steel production

monopoly in Texas, so long as it is located in the First Congressional District.

It is difficult to believe that a statesman of this caliber, an outspoken advocate of competition, could have a personal motive in blocking the return of competitive selling to the steel and other industries, but when the Justice Dept. and Federal Trade Commission, agencies for which the Texan pledges undying support, endorse the legislation and when its original sponsor is Senator O'Mahoney, D., Wyo., a sincere antimonopolist, such a conclusion is almost inescapable.

THE steel-industry hairshirt threw his first road block in the way of S 1008 last Thursday when he succeeded in delaying action on the measure by the House Judiciary Committee. A Judiciary subcommittee, headed by Representative Walter, D., Pa., had speedily approved the bill after brief hearings and an even briefer executive session. The full committee delayed voting on the bill so that Mr. Patman could testify at a closed hearing earlier this week.

However, the Texas legislator is not expected to get very far in his efforts to kill or amend the bill even though he may continue to harrass it through the Rules Committee and on to the House floor. It is understood that the House leadership has already indicated that the bill will be favorably acted upon.

The speed with which this bill has moved after it was decided to junk moratorium legislation has been surprising. First surprise was introduction of the bill on the Senate floor by Senator O'Mahoney, a long time critic of the steel industry. The Senator also appeared before the House subcommittee to support his measure.

In his appearance on the House side, Senator O'Mahoney declared that "if we desire to maintain the private enterprise system, the first duty of Congress is to clear up uncertainties of the law such as exist in this situation."

THE bill before the House as this issue went to press was amended in several respects which resulted in the bill being more acceptable to the FTC and the Justice Dept. At the subcommittee hearings, Representative Walter stated that he was authorized by the FTC to state that FTC did not oppose the bill if it were amended as was later done.

THE IRON AGE later learned that this word was passed to Representative Walter by the acting chairman of FTC, Lowell B. Mason. The amendments would restore to industry the right to use good faith competition as a defense against an FTC complaint which held that the effect of freight absorption would be to lessen competition. FTC and Justice felt that it was unfair to industry to deny it this defense. This change represents a victory for FTC Commissioner Mason, who took this position in his dissent in the Standard Oil Case.

Another amendment resulted in wiping out the ambiguity in the Senate bill regarding industry's right to absorb freight to meet an equally low price of a competitor or to maintain a customary differential.

The final amendment had to do with the proof that FTC must have to back up any charges that a delivered pricing system would lessen competition. The Senate bill called on FTC to provide "substantial and probative evidence." The amended bill requires FTC to prove only "reasonable probability."

REPRESENTATIVE WALTER also declared that he was going to do all in his power to assure that any bill enacted by the House would not result in the Congress giving approval to any FTC practices that the commission has assumed to assert and which were not originally intended by the Congress.

He also set aside some doubt in industry circles that the bill would permit "systematic" freight absorption. In his view, the bill does so as long as it is done individually and independently.

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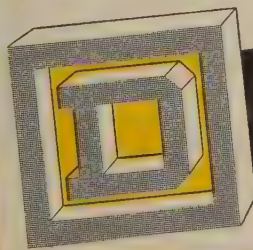
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Assistant Attorney General Herbert A. Bergson in charge of the Antitrust Div. also endorsed the bill with the changes made by the subcommittee. He stated that the Justice Dept. believes that the bill accomplishes "exactly what Senator O'Mahoney stated to be the objective; namely, to declare that delivered prices and freight absorption are not unlawful per se."

Giving the lie to the opinion of some FTC staff members that this legislation would basically weaken the antitrust statutes, Mr. Bergson stated that "it does not broaden and does not narrow the antitrust laws but merely restates them and should eliminate all confusion."

In this connection, it should be made clear that while the commission stated it has no objection to the amended bill some of the die-hard staff members will do their best to continue to strike at practices that would be apparently legalized by such legislation.

IT has already been pointed out to THE IRON AGE that if FTC so desires there are enough loop holes in the bill to permit a four-span team of horses to be driven through. There is no doubt that the future safety of industry regarding delivered pricing systems

rests in substantial part on the construction FTC places on the bill. It will be long remembered that FTC's theory that price means "mill net return" lies at the bottom of the current difficulties regarding pricing practices.

However, the definition of delivered price in the bill which states that such a price is a price "at which a seller makes or offers to make delivery of a commodity to a buyer at any delivery point other than the seller's own place of business," will probably prevent the commission from using the "mill net return" theory in future delivered price cases. It is possible that this definition may also require some change in industry selling methods. In other words, sellers who wish to take advantage of the legislation may find it necessary to sell at so-called "true" delivered prices; that is, the seller actually pays the cost of transportation and does not transfer title to the buyer until the goods are physically delivered by the carrier at the buyer's place of business. The bill may prevent the now common practice under which the buyer actually pays the freight but receives an adjustment depending upon the nature of the delivered price system used.

Labor Board Outlaws Union Shop Clause In UMW Bargaining

Washington

••• The National Labor Relations Board has definitely thrown out the union shop clause as a condition of new contracts with captive mines. Moreover, the board ordered John L. Lewis and the United Mine Workers not to instigate, encourage or approve strike action to support such demands.

The ruling is a result of a complaint filed last July by Jones & Laughlin Steel Corp. and upheld the finding issued last January by a trial examiner. While the NLRB dismissed the J&L allegation that the UMW had refused to bargain, it laid the blame for the mid-1948 strike squarely on the UMW.

"The UMW and Lewis did not merely insist upon the companies' acceptance of the unauthorized union shop as a condition for concluding an agreement but also resorted to strike action to support their demands," the board agreed unanimously.

In effect, the UMW not only may not use the union shop clause for bargaining but it cannot demand that the 18 captive mines fire non-UMW members. Nor may a strike be called for any reason related to such demands.

Outlawing of the union shop in respect to the 18 captive mines is based by the board on the fact that the clause in the current contract has never been approved by the workers in a government-held election. Such an election is illegal under present law because UMW has not filed the complete data required by the law.

Studies Mining Equipment

Washington

••• Asbjørn Boersting, Electrical superintendent of the Sydvaranger Iron Mines in northern Norway, is now in the United States to study electrical equipment used in American mining operations.

Two other officials of the Norway company arrived in May to begin studies that are designed to help Norway in the rehabilitation of mines destroyed during the war.

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BY J. R. WILLIAMS



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• Expansion of electric power producing facilities in California encouraging to industrialists . . . Two western steel plants continue to operate at capacity.



FEATHER RIVER CANYON, CALIF.—If the assurance of six vice-presidents of the Pacific Gas & Electric Co. and the physical evidence of two dams and two power houses under construction are indicative, industry in northern and central California need never again fear electric power curtailments similar to those in effect early in 1948.

PG&E is already the third largest privately owned electric power producer based on load with a generating capacity approximately 180 pct of that of Hoover Dam, 52 pct greater than Grand Coulee and Shasta Dams combined and is now engaged in a construction program which will add nearly 2 million hp.

Present expansion of facilities is probably the world's largest power building program entailing an investment of private capital exceeding \$600 million in steel, concrete, equipment and payrolls. Here along a 16-mile stretch of this picturesque river, about 2 miles south of Belden, a \$62 million, four unit project is nearing completion on a record breaking 2½ year schedule employing 3000 men.

Two diversion dams and two power houses are being added to the three existing hydroelectric plants on this water shed. The most northerly of these new proj-

ects is the Rock Creek Dam, 115 ft high, 500 ft long which will divert the river into a tunnel 25-ft in diam and 6½ miles long and carry the water downstream to a point 383 ft above the power house at water's edge. Two steel penstocks 12-ft in diam manufactured by Consolidated Western Steel Corp. carries the water to generators which will produce 169,000 hp.

Two miles below this power house the water is again collected in another reservoir created by Cresta Dam which is the same height as the Rock Creek Dam but only 350 ft long. Water from this dam is channeled through 4 miles of 26 and 27 ft diam tunnels and falls 172 ft through steel penstocks to operate the generators of the Cresta power house to produce 101,000 hp.

Neither of these dams will hold large quantities of water but merely divert the stream into the supply tunnels. Rock Creek will store 4200 acre ft in a 2½-mile-long lake and the body of water behind Cresta will be considerably smaller. Two steel drum gates, 28 ft high by 124 ft long and one radial gate 22x15 ft will control the flow of water over the spillway of Rock Creek Dam.

TO handle the increased power to be produced by these two new units, 32 additional miles of steel tower line are being built from Bucks Creek powerhouse to Oroville, Calif., from which it will be transmitted to Bellota substation near Stockton, Calif., where distribution begins.

Because of the narrowness of the canyon at Rock Creek it has been necessary to build a large concrete structure over the highway to carry the electrical switching equipment.

Cresta power house is scheduled to start producing next November and in February 1950 Rock Creek power house is to be put on the line. These two plants will bring the total additional generating capacity of this company since V-J day up to 863,200 hp and other new plants under construction will add more than a million additional hp by the end of 1951.

Five contracting firms are handling actual construction on this project with Morrison-Knudsen Co., Inc. building both dams and the Cresta power house and driving 4000 ft of the Rock Creek tunnel. Rock Creek power house is being built by the Walsh Construction Co. which is also drilling 6700 ft of Rock Creek tunnel. The remaining 24,000 ft of this tunnel is under contract to the Arundel Corp. and L. E. Dickson Co. of San Gabriel. T. E. Connolly, Inc. of San Francisco is driving Cresta tunnel.

Approximately 17,676 tons of steel is being used on these two projects, broken down as follows: penstocks (Cresta ½-in. to 15/16-in. thickness and Rock Creek ½-in. to 1 3/16-in. thickness), 2110 tons; structurals, 604 tons; reinforcing bars, 5000 tons; generators, 1000 tons; turbines, 1880; transformers, 350 tons; oil circuit breakers, 500 tons; butterfly valves, 190 tons; cranes, 328 tons; bus and switch structures, 120 tons; drum gates, 2728 tons; radial gates, 22 tons; trash racks, 280 tons; wheel gates, 164 tons; drill steel, 400 tons; tower transmission steel, 1000 tons and miscellaneous, 1000 tons.

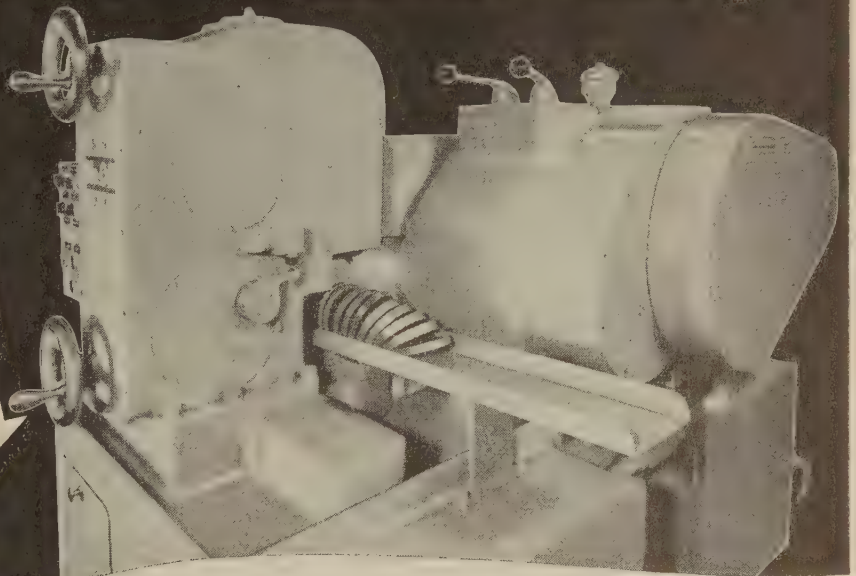
These and other improvements in the supply of electrical energy are of particular importance to public officials and businessmen in Stanislaus County of California where the government-owned Riverbank aluminum reduction plant is located.

ONCE more there is considerable agitation to reopen this government built plant which has a rated capacity of approximately 48,000 tons of aluminum pig per year and which closed down in August of 1944 after operating only 15 months. At full capacity Riverbank demanded a power supply of 854 million kw-hr and during its period of operation paid approximately 5 mills per kwh. At the present time only sufficient power is available to operate one of the three pot lines and it is estimated that it would be 3 or 4 years before power facilities have been

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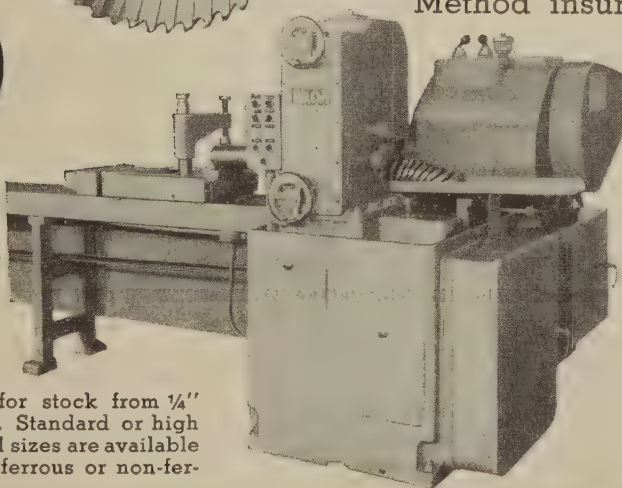
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expanded sufficiently to permit full production. Even though this power were available the plant could hardly operate competitively against other similar producers throughout the country who pay from 1½ to 3 and 4 mills per kwh. During operation of this plant by Alcoa for the government power cost per lb of pig were from 4½¢ to almost 5¢.

In addition to high priced and limited power, this plant also faces the same bugaboo of other aluminum producers in the control of fumes and gases which would mean increased expenditure for filters and condensers. Consensus of observers here is that the entire plant is uneconomic in a peacetime market, especially now that aluminum is becoming readily obtainable and curtailments in plants of other producers are common. The Kaiser controlled Permanente Metals Corp. has borrowed one pot line for use at its Tacoma plant which is subject to recall by the government.

Although hydroelectric power is still dominant in the West, there is a trend to steam generating plants where cost of production is closely related to the price of oil. While there is considerable difference of opinion as to western oil reserves and probability of de-

pletion, new fields and new wells continue to be brought in.

Richfield Oil Co. is expanding its operations in the Cuyama Valley in southern California between San Joaquin Valley and the coastal region where its first well was brought in June 1948 at a rate of 500 bbl per day of 38.3 degree gravity oil from a total depth of 3360 ft. A second well was brought in 5 days later at a depth of 3022 ft and flowing at the rate of 4000 bbl per day of 32.8 gravity oil.

Since the initial discovery well 79 additional producers have been completed in one section of the field and in May of this year another new field was discovered with the initial well bringing in 5080 bbl per day of 34.2 gravity oil. Richfield is now producing approximately 17,000 bbl of oil per day from 82 wells so far completed with the last one having been brought in early in June on the Machader property. Although Richfield may be considered a small operator, a \$1½ million stock of steel casing is maintained and used at the rate of approximately 150 tons per month. Until recently this company was engaged in the purchase of billets for conversion into pipe but during the last few months this practice has been found unnecessary.

These and other surveys confirm the opinion of the six PG&E vice-presidents interviewed to the effect that short of a war or major catastrophe, industry in this state need not delay expansion because of a possible power shortage.

Jet Planes Pass Tests

Los Angeles

• • • Successful tests with two needle-nosed jet planes indicate that the Los Angeles area is becoming more and more the center for much of the rivalry between the Navy and Air Force over air superiority.

Already, both groups have been interested in tests of planes turned out by Northrop and North American.

Newest sensation is a Navy D-558-2, Douglas craft which resembles a flying swordfish. In tests over Muroc dry lakes this plane became the first to use both rocket and jet power while in flight.

After exhausting its rocket fuel, the Navy test plane continued on a routine research flight and landed under turbo-jet power.

The craft is a sequel to the Navy's Skystreak, which twice broke the world's speed record in 1947. It was described as "extremely stable, sensitive and light as an arrow" during the rocket-jet test. A virtual flying laboratory, the plane is being used to study advanced power plants and speeds near the sonic range.

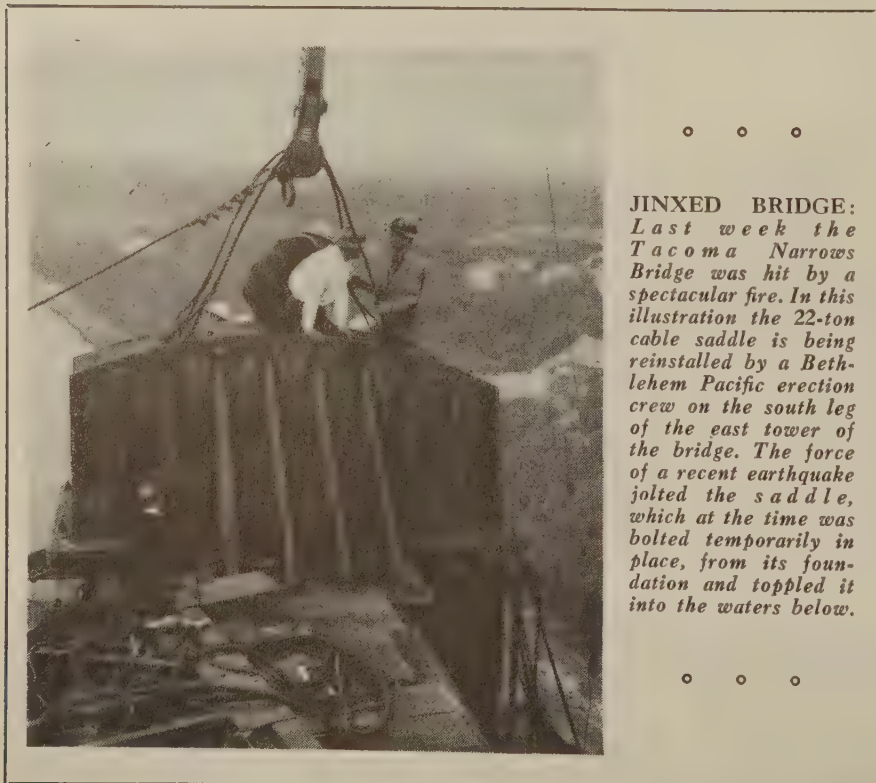
On the Air Force's part, an announcement was made of taxi tests of a twin-engined F-90 jet fighter designed as a "penetration" plane. A long-range attack craft, it is designed to operate far behind enemy lines, seeking out ground targets for its heavy fire power.

Built with a needle nose and a scorpion-like tail the plane is built to take heavy punishment.

Steelworkers Walkout

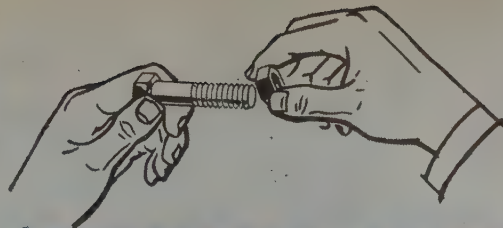
Seattle

• • • Early this month 225 employees were affected by a walkout of 180 steelworkers at the Northwest Steel Rolling Mills. Up until late last week there had been no negotiations between the employers and employees who are demanding a 13¢ an hr increase and other considerations. All operations at the plant have ceased.



JINXED BRIDGE:
Last week the Tacoma Narrows Bridge was hit by a spectacular fire. In this illustration the 22-ton cable saddle is being reinstalled by a Bethlehem Pacific erection crew on the south leg of the east tower of the bridge. The force of a recent earthquake jolted the saddle, which at the time was bolted temporarily in place, from its foundation and toppled it into the waters below.

"A BOLT IS ONLY HALF A FASTENER WITHOUT A NUT!"



FOR A *Complete* QUALITY **"FASTENER TEAM"**
USE **LAMSON NUTS!**



It takes *two* to complete a "fastener team"... a bolt and a nut. Quality bolts *deserve* the plus values found in Lamson nuts... the accurate fit and dependable holding power.

Lamson makes many different types of nuts in hundreds of shapes, styles and sizes... a nut for almost every purpose.

Whether you need standards or specials, in plain, plated or stainless steel—in brass, bronze or aluminum, Lamson makes them all.

Think of Lamson nuts when you buy bolts... and buy *both*!

THE LAMSON & SESSIONS COMPANY

General Offices: 1971 West 85th Street, Cleveland 2, Ohio

Plants at Cleveland and Kent, Ohio • Chicago • Birmingham

Lamson & Sessions

"One Dependable Source for All Fastener Needs"

SEMS	LOCK NUTS	NUTS	STUDS
STOVE BOLTS	LAG BOLTS	WASHERS	RIVETS
TAPPING SCREWS	ROPE CLIPS	SET SCREWS	PLOW BOLTS
"1035" CAP SCREWS	MACHINE BOLTS	CARRIAGE BOLTS	COTTER PINS

WANT MORE INFORMATION on any of these fasteners? CHECK—and CLIP this strip.



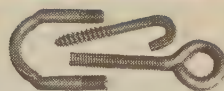
LAMSON LOCK NUTS: Economical, vibration-proof. Can be re-used repeatedly.



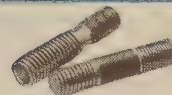
SEMS: Tapping and Machine Screws with Lockwashers attached.



COTTER PINS: Steel, Brass, Aluminum and Stainless Steel



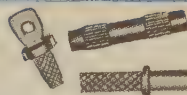
"BENT" BOLTS: Including U Bolts, Eye Bolts, Hook Bolts, etc.



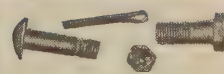
LOK-THREAD STUDS: Thread locks and seals in standard tapped holes.



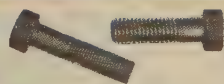
Wire Rope Clips: Hi-Center saddles, extra-strength U Bolts.



PLASTIC INSERTS: To your specifications... in production quantities.



AIRCRAFT FASTENERS: AN Bolts, Nuts, Screws, Studs and Cotters.



"1035" CAP SCREWS: Hi-Tensile heat-treated steel.

The Lamson & Sessions Company
1971 W. 85th St., Cleveland 2, Ohio

NAME _____

POSITION _____

COMPANY _____

STREET _____

CITY _____ ZONE _____ STATE _____

PERSONALS

• • •

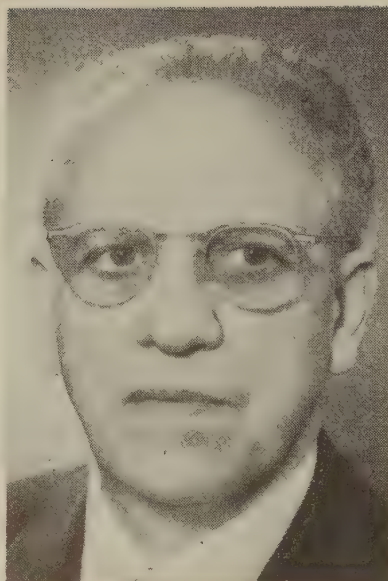
• **Kenneth D. Mann** has been elected chairman of the board of Firth Sterling Steel & Carbide Corp., McKeesport, Pa. Previous to his new appointment, Mr. Mann had been manufacturing vice-president of Reynolds Metals Co. and executive vice-president of Truscon Steel Co.

• **Daniel R. Donovan** has been appointed sales manager of Elmet and fine wire products for North American Philips Co., Inc., located at the new headquarters which have been moved from New York to Lewiston, Maine. Mr. Donovan had formerly served as vice-president and sales manager of Callite Tungsten Corp. **Philips W. Blackburn** located in the New York office, in charge of export sales of all wire products, continues to handle sales of Elmet tungsten and molybdenum, diamond dies and fine wire products in metropolitan New York area.

• **John H. Higinbotham** and **John P. MacLean** have been appointed assistant district sales managers, Republic Steel Corp., Cleveland. Mr. Higinbotham, who serves in the Houston district office, began as a salesman for Republic in New York in 1934. In 1938 he was transferred to the Tulsa, Okla., office of the company and for the past 10 years has been a salesman in the Houston office. Mr. MacLean, who serves in the Buffalo territory of the company, has spent over 20 years there, first as a salesman for Republic's Union Drawn Steel division and since 1939, as a salesman for all Republic products.

• **Philip K. Poulton** has been elected secretary-treasurer of Follansbee Steel Corp., Pittsburgh. For the past several years Mr. Poulton has been employed in management consulting work and prior to that had been vice-president of Talon, Inc.

• **Carl J. Koelsch** has been elected vice-president and a director of Warren Steel Corp., Detroit. Mr. Koelsch had recently served as chief buyer with the Budd Co., Detroit and Philadelphia.



HARRY H. LUMLEY (left), assistant to vice-president of operations, and **JOHN R. GAUT** (right), manager of operations, Chicago District, American Steel & Wire Co.

• **Harry H. Lumley**, Chicago district manager of operations for American Steel & Wire Co., Cleveland, and a veteran of the steel industry who has been associated with the U. S. Steel Corp. since the year it was organized, has been appointed assistant to the vice-president of operations of the Wire company. **John R. Gaut**, presently assistant manager of operations, has been named to succeed Mr. Lumley as Chicago district manager of operations. Mr. Lumley continues his headquarters in Chicago. He started his career with U. S. Steel as a messenger for Illinois Steel Co. in 1901. Mr. Gaut joined the Wire company in 1919 as a recorder at the company's steel works in Donora, Pa., and in 1943 became general superintendent. In 1948 he became assistant manager of operations in the Chicago district.

• **Herbert T. Wheeler** has joined the brokerage division of Hetz Construction Co., Warren, Ohio. Mr. Wheeler had formerly served as director of procurement for the Federal Machine & Welder Co. and prior to that had been president of the Peerless Mfg. Co. and secretary-treasurer of the Breece Mfg. Co.

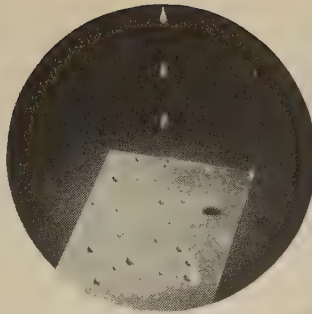
• **Homer A. Simpson** has been named vice-president in charge of sales, Daystrom Corp., Olean, N. Y. Mr. Simpson had formerly served the American Fixture and Mfg. Co. for 13 years.

• **Ralph H. Heberling**, vice-president in charge of manufacturing of Edward Valves, Inc., East Chicago, Ind., has retired. Mr. Heberling joined the Edward organization in 1942 as assistant to the president and became vice-president in 1944.

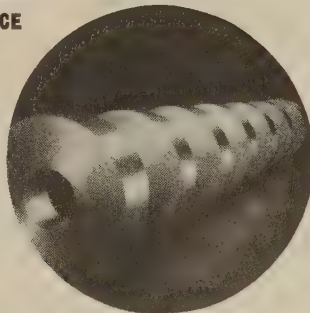
• **F. K. Krell** has been promoted to manager of sales, welding fittings, Globe Steel Tubes Co., Milwaukee. Mr. Krell joined the general sales staff of Globe in 1942 and since 1947 has been Chicago district sales representative. **John F. Scott** has been made manager of sales, stainless and alloy tubing. Mr. Scott came to Globe in 1940 as a metallurgist and since 1947 has been sales representative for the New York district. **John Koss**, has been appointed sales representative, Chicago district. Mr. Koss joined the general sales staff of Globe in 1946. Previous to his new appointment he had been in charge of export sales. **J. J. Lukens** has been made sales representative in the New York district. Mr. Lukens started in the laboratories of the company in 1938. He was transferred to general sales in 1948 as sales correspondent and prior to his recent promotion had headed the pricing division.

• **Howard W. Jordan** has been elected a director of the National Supply Co., Pittsburgh, filling a vacancy created by the resignation of **J. H. Hillman, Jr.**

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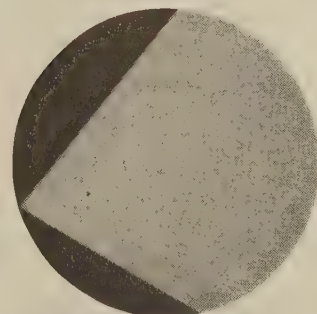
CORROSION RESISTANCE



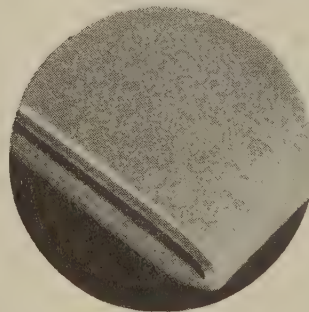
UNIFORMITY



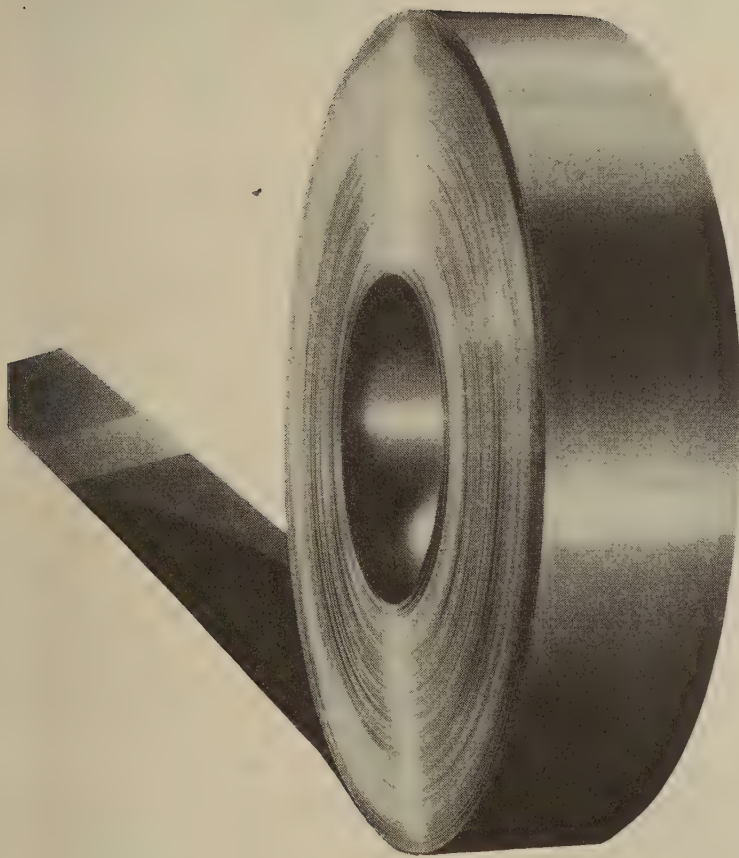
GAUGE ACCURACY



QUALITY FINISH



COATING ADHERENCE



the Cold Metal Products co.

YOUNGSTOWN 1, OHIO

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THE IRON AGE, June 16, 1949—123



JAMES B. DuPRAU, vice-president, administration, Columbia Steel Co.

• **James B. DuPrau** has been elected vice-president, administration, Columbia Steel Co., with headquarters in San Francisco. Mr. DuPrau has been assistant to the president since 1943 and continues to work with that official on problems of general company administration and direction of staff phases of planning, coordination and control. He has been associated with Columbia since 1935.

• **George E. Healey** has been named sales planning supervisor, New Holland Machine Co., New Holland, Pa.

SAM R. WATKINS (left), and **JOHN F. DUCEY, JR.** (right), district sales managers, Brake Shoe & Castings Div., American Brake Shoe Co.



• **James W. Lintern** has been elected executive vice-president of Lintern Corp., Berea, Ohio. **J. N. H. Christman, Jr.**, has been named vice-president in charge of engineering, **Ted Ley**, vice-president in charge of production, **F. T. Siersma**, vice-president, **Edward Warnoski**, assistant treasurer and auditor and **John C. Lintern**, secretary.

• **J. P. Connors** and **Norbert J. Connors** have been appointed Pittsburgh sales representatives of the National Erie Corp., Erie, Pa.

• **S. S. Stewart** has been appointed purchasing agent, manufacturing division, Air Reduction Sales Co., New York, with his headquarters in Jersey City. Mr. Stewart has been with the company since 1922 when he joined the Wilson Welder & Metals Co., Inc., as production manager. Previous to his appointment as purchasing agent, Mr. Stewart had been assistant purchasing agent.

• **Theron Howard**, head of tractor sales and service in the eastern division of the Hyster Co., Portland, Ore., since 1941, has been made manager of the Peoria, Ill., plant. Mr. Howard joined Hyster 10 years ago. **J. F. Lewis**, formerly in charge of production and purchasing at the Peoria plant, is being transferred to Portland to assume the duties of chief production engineer.



EDWIN V. RECKLEY, export manager, Welded Wire Fabrics Div., Forbes Steel Corp.

• **Edwin V. Reckley** has been appointed export manager of the welded wire fabrics division of Forbes Steel Corp., Canonsburg, Pa. Mr. Reckley joined Forbes last month, having previously served the Northwestern Steel & Wire Co. and Pittsburgh Steel Co.

• **R. W. Steere, Jr.**, has been made assistant chief engineer of Plymouth Motor Corp., Detroit. Mr. Steere replaces **A. W. Ross** who has been transferred to an executive assignment with the Chrysler Corp.'s central engineering division. Mr. Steere, formerly Plymouth chassis engineer, joined the Chrysler Corp. in 1937 and was later transferred to the Plymouth division.

• **Robert E. Busey** has been named chief engineer of Ford International, Inc., New York, with headquarters in Dearborn. Until recently, Mr. Busey had been chief engineer of Willys-Overland Motors, Inc.

• **Sam R. Watkins** and **John F. Ducey, Jr.** have been appointed district sales managers of the Brake Shoe & Castings division of American Brake Shoe Co., New York. Mr. Watkins has been with Brake Shoe since 1939, joining the company as an apprentice. He is located in the Cleveland office. Mr. Ducey first started with Brake Shoe in 1936 also as an apprentice, and is located in the New York office.



JOHN J. LITTLEY, sales engineer, Baldwin Locomotive Works

• **John J. Littley**, who has served in various engineering and sales capacities since 1946 when he joined Baldwin Locomotive Works, Philadelphia, has been appointed sales engineer for hydraulic presses and power tools, and assigned to Baldwin's Chicago district office.

• **Clarence W. Albright** has been elected president, **Edward G. Miller**, vice-president, **William J. Hyatt**, treasurer and **Sylvester Edwards**, secretary, General Heat Treating Corp., Syracuse. All officers of the company are former employes of R & B Rock Bit Co., who have acquired the business from the estate of Walter A. Bolton, late president of R & B.

• **H. D. Carus** has been elected president of Matthiessen & Hegeler Zinc Co., LaSalle, Ill., succeeding **Robert McClurkin**, who died.

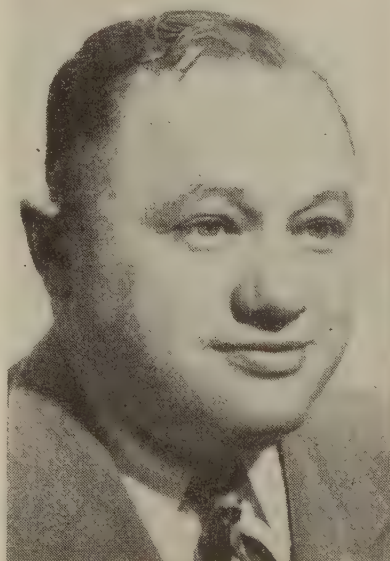
• **William H. Chaffee** has been appointed vice-president, refrigeration operations, and **Samuel N. Regenstrief**, vice-president, refrigeration production, Philco Corp., Philadelphia. Mr. Chaffee joined the purchasing department of Philco in 1934 and was later named purchasing agent of the company's refrigerator division. Mr. Regenstrief has been with Philco since 1947 when that firm acquired Rex Mfg. Co., with which company he was connected since 1939.

• **John W. Clark** has been appointed director of sales and executive assistant to the president, Capewell Mfg. Co., Hartford. Mr. Clark had been assistant to the president since early this year and had formerly been associated with Westinghouse Electric International Corp. **P. W. Grace** has been appointed assistant to the president.

• **Alfred C. Viebranz**, formerly government sales representative for the electronics division of Sylvania Electric Products, Inc., Boston, has been appointed special representative in Washington, D. C. In addition to serving as special representative for the company's electronics and radio divisions and the central engineering laboratories, he serves as a technical consultant on all phases of government relations. Mr. Viebranz joined the Sylvania staff as a sales engineer in 1946.

• **Robert L. Baker** has been named manager of sales planning of the replacement tire sales division of the B. F. Goodrich Co., Akron, Ohio. Mr. Baker, who joined Goodrich in 1934, had been assistant manager of passenger car tire sales and is succeeded in that post by **Charles H. Caldwell**, who has been with the company since 1944 and had been advertising and sales promotion manager for shoe products and sundries prior to his promotion.

SAMUEL N. REGENSTRIEF (left) and **WILLIAM H. CHAFFEE** (right), vice-presidents, Philco Corp.



C. H. BRIGGS, vice-president, Rudel Machinery Co.

• **C. H. Briggs** has been elected vice-president of Rudel Machinery Co., New York, in charge of the C. H. Briggs division of the company. This division resulted from the recent merger of the C. H. Briggs Machine Tool Co., Inc., of Syracuse with the Rudel Machinery Co., and the purchase by Rudel of the George Keller Machinery Co., Buffalo.

• **M. S. Bandoli** has resigned as vice-president in charge of sales for Tracy Mfg. Co., Pittsburgh.



• **George L. Palmer** has been elected chairman of the board, Wilson Foundry & Machine Co., Pontiac, Mich., succeeding **Arthur J. Wieland**, who resigned.

• **J. D. Greensward** has been appointed general manager of the Norwood, Ohio works of Allis-Chalmers Mfg. Co., Milwaukee, succeeding **Frank H. Stohr**, who died. Mr. Greensward, who had previously been assistant to the executive vice-president in charge of the general machinery division, has been with the company since 1925. **Robert S. Fleshiem** has been named to succeed Mr. Greensward and **Roy M. Casper** becomes manager of the company's electrical department. Mr. Fleshiem joined the Norwood Works in 1904 and since 1929 had been manager of the Allis-Chalmers electrical department. Mr. Casper joined the company in 1936 as a sales representative in Detroit. Since 1947 he has been manager of the motor and generator section.

• **Samuel Wit** assumed his duties as district manager of sales of the Chicago office of Lukens Steel Co., Coatesville, Pa., on June 6, not July 1, as stated in the announcement of his promotion in the June 2 issue of THE IRON AGE. **J. H. Faunce, Jr.**, who has been manager of the Chicago office, assumes other duties with Lukens about July 1.

• **Ambrose W. Staudt**, manager of the Du Pont Company's nylon technical service section for the last four years, has been appointed manager of the market research section of the company's trade analysis division. **George H. Braniff**, who has been assistant manager of the nylon technical service section for the last year, has been appointed to the position of manager of that section, succeeding Mr. Staudt. Mr. Staudt has been with the nylon organization since 1936, has been with Du Pont since 1928. Mr. Braniff has been with the Du Pont rayon organization since 1933.

• **J. L. Tunstead** has been named sales manager of the metal products division, Koppers Co., Inc., Baltimore, succeeding **McMillan Robinson**, who died. Mr. Tunstead joined the central sales department of the company in 1948.



GILBERT SOLER, vice-president and director, Atlas Steels Ltd.

• **Gilbert Soler**, formerly works manager has been named vice-president, manufacturing operations and a director, Atlas Steels Ltd., Welland, Canada. Mr. Soler has been with the company since 1946. He had previously been associated with Republic Steel Corp. and the steel division of the Timken Roller Bearing Co.

• **William A. M. Burden** has been elected a director and **Herbert Cohen**, assistant treasurer, has been elected comptroller of the American Metal Co., Ltd., New York.

• **James M. Young** has been appointed chief industrial engineer of Levinson Steel Co., Pittsburgh. **J. Rose Lewis**, formerly with Plasteel Products Co., has joined the sales department of Levinson. Mr. Young has been with Levinson Steel for two years and had formerly been associated with Methods Engineering Co.

• **Charles P. Walker, Jr.**, has been appointed general sales manager of Chas. Pfizer & Co., Inc., Brooklyn. **Frank F. Black** has been made acting manager of medicinal sales division, succeeding Mr. Walker in that capacity. President of the Citro Chemical Co. during 1946 and 1947, Mr. Walker still serves in that capacity and as a director of Citro, now a Pfizer subsidiary. He joined the executive sales department of Pfizer in 1948. Mr. Black had previously been associated with Burroughs Wellcome & Co. in an executive capacity and joined Pfizer's sales department in 1945. **Franklin B. Albright** has been appointed field sales manager for the midwestern region, located in Chicago. Mr. Albright has been associated with Pfizer for the past 11 years as a sales representative.

• **Charles C. Cheyney** and **Arthur M. Kiely**, sales manager and controller, respectively, Buffalo Forge Co., Buffalo, have been elected directors of the company.

OBITUARY...

• **Charles W. Guttzeit**, 73, former president, Latrobe Electric Steel Co., New York, died June 6.

• **Steven Johnson**, 46, district manager, N. Y. territory, Auto-Lite Battery Corp., died May 28.

• **Elmer Z. Taylor**, founder of Mono Service Co., Newark, N. J. and consulting engineer, Continental Can Co., New York, died May 20.

• **W. Lawrence Kennedy**, 48, sales manager of the Sisalkraft Co., Chicago, died May 18.

• **Hubert Merryweather**, 67, retired general manager of ore properties, Bethlehem Steel Co., Bethlehem, died June 7.

• **Abraham Rubin**, 58, formerly vice-president, National Smelting Co., Cleveland, died recently.

• **William R. Timken**, 84, co-founder and formerly secretary-treasurer, Timken Roller Bearing Co., Canton, Ohio, died recently.

• **Robert F. Hubbard**, 73, formerly member of the board, Revere Copper & Brass Co., died in Cazenovia, N. Y., recently.

• **Irving E. Bowen**, for many years district purchasing agent, American Steel & Wire Co., Chicago, died recently.

• **William A. Davis**, 74, president for 40 years, Babcock Davis Corp., Boston, died June 4.

• **Edward W. Botten**, 51, secretary-treasurer and founder, Owens Bucket Co., Cleveland, died June 5.

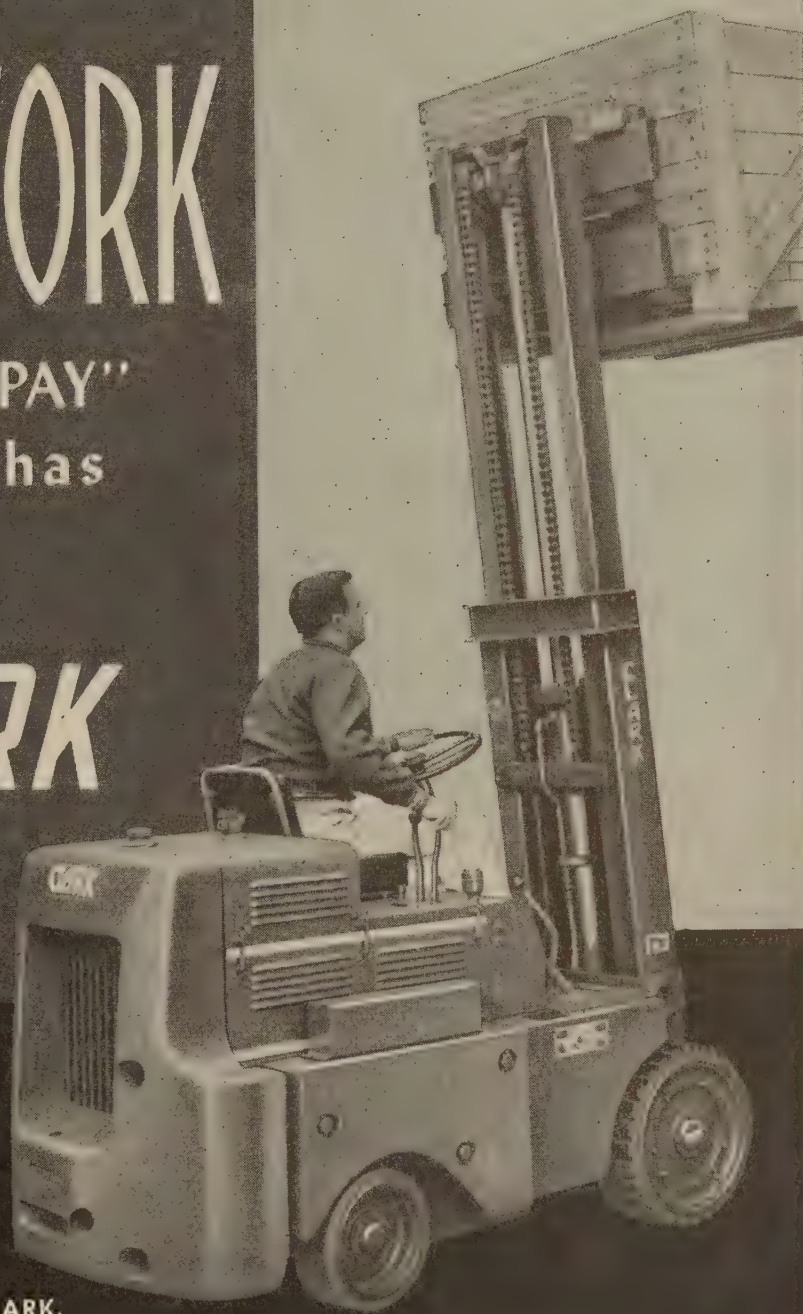
This
Fork Truck
DOES
MORE WORK

FOR LESS "PAY"
because it has

DYNA
TORK
Drive

Available *only* in CLARK'S gasoline-powered Utilitrac, DYNATORK DRIVE eliminates the clutch and conventional transmission. Nothing comparable in the fork-lift-truck field. Benefits so numerous that the important question is: CAN YOU AFFORD TO BE WITHOUT IT?

To help get the answer—to enjoy unsurpassed counsel on any materials-handling matters—CONSULT CLARK. Please direct inquiries on your business letterhead to address listed below.



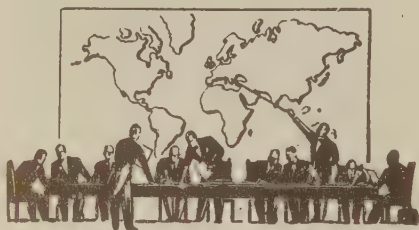
INDUSTRIAL TRUCK DIVISION
CLARK EQUIPMENT COMPANY

BATTLE CREEK 51, MICHIGAN

AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

European Letter . . .

• Western Europe involved in worst form of planning . . . Indications are she will emerge from Marshall era less economically unified than before . . . Joint program of action necessary to remove underlying hindrances.



LONDON — The eight Ministers who form the consultative group of the Organization for European Economic Cooperation have just finished a series of discussions in Paris upon the problem of increasing the volume of European trade and removing the obstacles to its movement. The earlier problem, that of restoring European production, has been largely solved. This fact is brought out clearly in the comprehensive report recently published by the Economic Commission for Europe, which establishes the fact that in 1948 European production (Germany excepted) surpassed the 1938 level by 13 pct; productivity rose in the one year by 9 pct, and the volume of exports by 30 pct. The ministers could, therefore, feel that the first aim of the Marshall Plan—the restoration of European production — had been achieved. The problem of Europe's markets and foreign trade is not, however, following the same smooth passage to solution and the ministers concentrated their discussions upon the mechanics of increasing trade within Europe. Various methods were examined and agreement was reached on proposals for liberalizing the methods and increasing the

flow of trade. But it is impossible to avoid the feeling that so long as discussion is concerned only with the mechanisms of trade and not with its actual content, the real problems facing Europe in its search for markets will go unsolved.

The first and most important of these is, of course, the old problem of the dollar gap. In 1948, the Marshall countries went some way towards balancing their accounts with the United States. Nearly \$1 billion were cut out of imports from the United States and Canada, but imports to North America only increased by \$150 million and remained well below the prewar figure. The uncovered balance with the United States remained as high as \$2.3 billion, and it is doubtful whether it can be reduced much further before 1952. The industrialized communities of western Europe will remain dependent upon large imports of foodstuffs and raw materials and North America is likely to remain the chief source of both. Since the war the United States and Canada have come to account for 46 pct of the world's exports of foodstuffs, and however

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quick and successful the attempts made to expand alternative sources of supply in Europe's colonial areas, the exports available by 1952 may not account for more than 2 pct of Europe's imports.

THE signs of recession in the American economy will, no doubt, modify the present outlook. This year American food prices have fallen sharply from the vastly inflated level of late 1948, and this fall must affect Europe's adverse terms of trade, which added \$1 billion to Europe's bill in 1948. But the consequences of an American recession remain equivocal. Spectacular falls in the prices of primary products in the United States are likely to be checked by Govern-

ment support programs. At the same time, European exporters will find the American domestic market harder to invade, while American competition with European exports in third markets such as Latin America may become formidable. It is certainly likely to be enough to prevent the capture by European manufacturers of half the United States' present Latin American markets — a feat forecast in the Marshall countries' long-term plans. While it may be difficult to forecast the exact size of Europe's dollar deficit at the end of Marshall aid, nothing has happened in 1948 to alter the conviction that will still be serious.

The progress of trade in the last year has shown that although the shortage of dollars is likely to be western Europe's greatest problem, developments in intra-European trade are throwing up other difficulties, smaller in scale but almost as intractable. All attempts to move toward multilateral trade and convertible currencies even within Europe have been stultified by the emergence of all-round creditors and all-round debtors. Belgium and Switzerland remain creditors to virtually all the Marshall countries. France has been as universally in deficit. Any attempt at automatic transferability such as was proposed at Paris would have the effect of finally turning all Belgium's credits with other countries into one large debt in French francs, owed by France to Belgium.

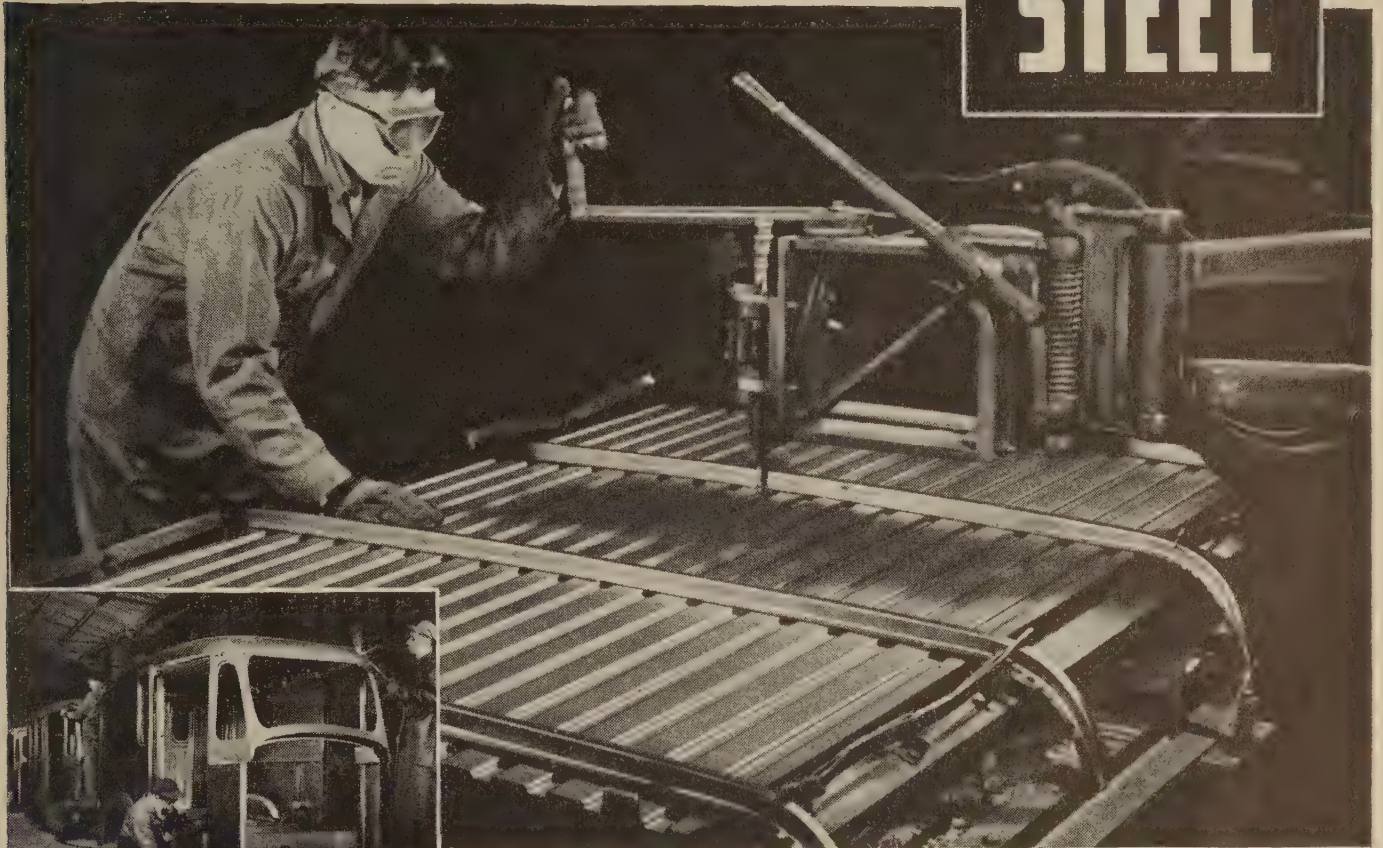
Another variant of the fixed debtor-creditor relationship is provided by the Bizone. As a result of the monetary reform, production and exports began to rise rapidly in 1948, and the Germans soon acquired a large export surplus with western Europe. But they continued to rely overwhelmingly upon the United States for their imports. At the same time, little effort was made to expand imports from western Europe. This policy has been liberalized in recent months, but

(CONTINUED ON PAGE 161)

Hughes-Keenan Corporation

Increases Truck Payloads 20%

with J&L OTISCOLOY high-strength steel



(Above) Spot-welding a truck roof-reinforcement and bow assembly, made of J&L OtiscoLOY steel, at the Hughes-Keenan Corporation, Delaware, Ohio. Both the panel and bows are cold formed.
(Left) Truck bodies on the Hughes-Keenan assembly line.



Builds stronger, longer-lasting truck bodies with less steel

Eliminating 20% of the deadweight from milk truck bodies is not the only advantage in using J&L OtiscoLOY high-strength steel, according to Hughes-Keenan Corporation, Delaware, Ohio.

For good sanitation, milk truck bodies must have their interiors steam-cleaned every day. Moisture from melting ice refrigeration during milk delivery is always present. Normally the continuous wetting and drying would cause rapid corrosion in a milk truck body made of mild steel.

OtiscoLOY resists rust four to six times

as effectively as mild steel. This pays off to the truck owner in longer service life. And it pays off to Hughes-Keenan Corporation in having a better quality, lighter, longer-lasting truck body.

The quality in these truck bodies does not entail added production costs. Although high-strength steel is more expensive than mild steel, OtiscoLOY is used two gauges lighter with equal or greater strength than ordinary mild steel. Four sections can be made from OtiscoLOY where only three sections of equivalent strength could be made from the same weight of mild steel. More units are produced per ton, freight costs are re-

duced, units are lighter, easier to handle during production.

OtiscoLOY is recommended for applications where strength without bulky weight is desired—also where corrosion, abrasion and fatigue are problems in the service life of equipment.

OtiscoLOY can be formed hot or cold, welded, forged, flame-cut and otherwise worked by standard methods. Here is a modern steel that is worth your investigation. Why not return the coupon to us today?

Jones & Laughlin Steel Corporation
403 Jones & Laughlin Building
Pittsburgh 19, Pa.

Please send me at once a copy of your booklet, "OtiscoLOY High-Tensile Steel."

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY and JALLOY (hi-tensile steels).

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

• **CARNEGIE REDUCES**—On June 10 Carnegie-Illinois Steel Corp. blew out No. 1 blast furnace at Duquesne Works. No. 6 was blown out June 6. Another was taken off this week. This leaves 33 of 36 blast furnaces operating in U. S. Steel's Pittsburgh-Youngstown district. Ten more openhearth were taken off at Duquesne on June 11. This leaves 6 openhearth out of 27 operating this week. Duquesne's electric furnaces are still running at 50 pct of rated capacity. Openhearth there are marginal facilities. For a while after the war they weren't even included in U. S. Steel capacity.

• **NOT YET**—Meeting early this week between John L. Lewis and Harry Moses provided no fireworks and no agreement. They talked, said little, and adjourned. Apparently Mr. Lewis was not quite ready, as no demands were made. Steel would like to wait until after the commercial operators have had their say. After that the situation might jell quickly.

• **LUKENS MILL DOWN**—The 120-in. four-high plate mill at Lukens Steel Co., Coatesville, Pa., will be shut down for repairs Sunday (June 19). Shutdown is expected to last 2 weeks. The 112-in. mill which serves as a breakdown unit will also be shut down. Company has recently laid off 200 men in Lukenweld machinery-making division.

• **QUOTA CUT**—Export quota restrictions on transformer grade electrical sheets were removed last week by Office of International Trade. Only iron and steel mill products now under quota are galvanized steel sheet, tin and terne plate, and iron and steel scrap. Export licenses are still needed.

• **NAIL EXTRA CUT**—American Steel & Wire Co. reduced the extra for hot galvanized wire nails 35¢ per 100 lb on June 7. New extra is \$2.45 per 100 lb in carloads and \$2.70 per 100 lb in less than carload lots. Change reflects recent reductions in zinc. Similar action reported by Tennessee Coal, Iron & R.R. Co., Birmingham.

• **ELECTRIC FURNACE OPERATIONS**—The rate of operations for electric furnaces in percentage of installed capacity has dropped to 57.4 pct for May from 72.7 pct for April.

• **WAREHOUSE PRICES**—Some warehouses have reverted back to the delivered-price system for shipment of some steel products outside the free delivery area.

• **CHANGE**—Thompson Products Inc., Cleveland, is slated to take over operation of the Mercast Corp. laboratory as it applies to the internal combustion field. The Mercast process (THE IRON AGE, Mar. 17) employs a frozen mercury pattern for production of castings. It is believed Thompson will use the process for production of rotors and jet blades.

• **WHEELING STEEL CUTS BACK**—First curtailment in steelmaking operations at Wheeling Steel Corp. were announced last week. One of three blast furnaces at Steubenville was blown out and openhearth were reduced to 7 out of 11. The Riverside blast furnace was banked and the bessemer works and blooming mill at Benwood Works were shut down for 2 weeks beginning June 12.

• **FARMERS SWITCH**—Farmers are cutting down on their purchases of new implements and are starting to concentrate on keeping present equipment running. This has helped the implement parts business. For the first time since the war manufacturing schedules of some corn picker lines are being cut back by manufacturers along with cuts in light tractor production and a few other items.

• **GALVANIZED PIPE**—On June 9 National Tube Co. announced a \$2 a ton reduction in galvanized pipe prices, retroactive to May 24. The new discounts are based on 11¢ per lb zinc. The former practice of dropping pipe prices with each drop in zinc has been abandoned, at least temporarily.

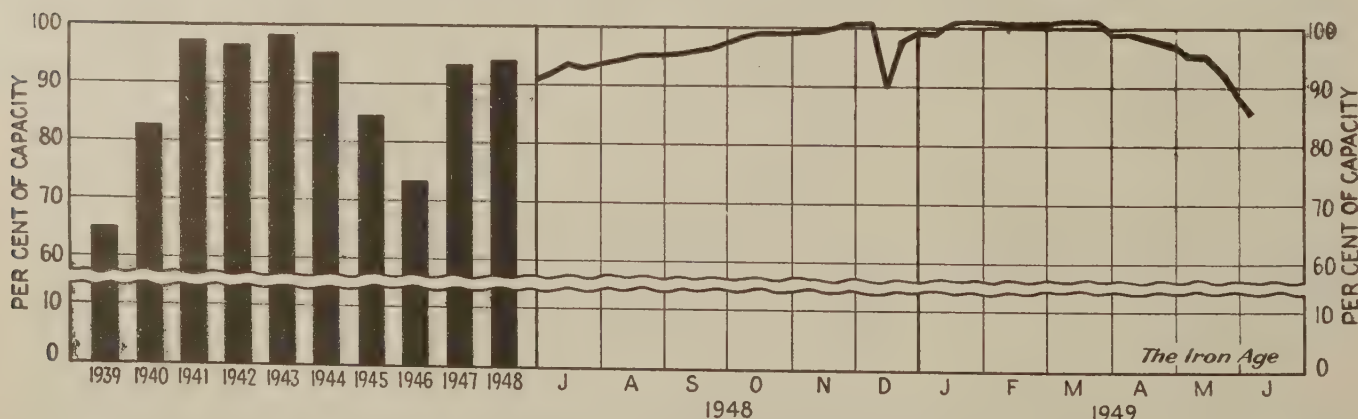
• **CHICAGO CURRENT**—The five major mills in Chicago are practically current on meeting delivery promises on all items. Only two mills out of the five are scheduled full for July. Open time is most prevalent on alloy and carbon bar products.

• **NO COKE**—A Baily Electric Shaft Furnace to make pig iron without using coke has been installed at Newcomerstown, Ohio, by Cascade Iron Corp. Pig iron and silvery iron are being produced on an experimental basis. Company reports that initial operations show promise.

• **WESTERN STRIP**—Kaiser Co., Inc. has reduced the price of its hot-rolled strip from \$4.65 per 100 lb to \$4.40 per 100 lb, f.o.b. Fontana.

• **IMPORTED SCRAP**—Scrap imports for the first quarter of this year amounted to 593,706 net tons.*

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
June 7.....	85.0*	99.0*	85.0*	92.0	95.5*	104.0	90.5	103.0	99.0*	86.5	79.0	75.0	85.0	89.0
June 14.....	85.5	97.0	77.0	88.0	95.0	102.0	80.5	103.0	98.0	88.5	75.0	66.5	85.0	86.5

* Revised.

Industrial News Summary

- **Labor and Management Far Apart**
- **But Some Agreement Is Expected**
- **Ingot Rate Still Sagging Fast**

STEEL labor and management are poles apart this week on the wage question. The steelworkers' union is on the defensive more than it has been in years. Management is determined that no concessions will be given that will raise the price of steel, increase overall costs or further depress the declining steel market.

Both sides may have to alter their outlook. But not before some harsh words are batted around. There are still no signs this week that an agreement can't be reached—one that will save face for steel and labor.

Philip Murray's attitude on wage and security demands will be somewhat as follows: (1) Present deflation is man-made and unnecessary, (2) it is being used to scare labor and cut down demands by the union, (3) some industrialists are too pessimistic, (4) higher wages are the only thing that will keep up purchasing power, (5) social security is a must and (6) pensions must be provided by industry. Steelworkers still smart over steel industry captive miners being eligible for \$100 a month pensions.

Steel management's attitude is: (1) The steel union has consistently held that everything steel management does is wrong, (2) steel orders have fallen off because customers have tightened up on their buying, (3) steel can do nothing but curtail operations when orders drop off, (4) higher wages are not warranted because they would force prices up when they should be leveling off, (5) social security benefits are nothing more than a disguised wage increase and (6) pensions were not in the present contract and have no place in negotiations.

Mr. Murray is expected to go to the public with his ideas on the current downturn in business. He believes it has caused millions of wage earners to hold up buying, conserve savings—if any. He claims it has caused depression jitters. If he has his way he will make it plain that management is at fault.

The steel union will insist that business should be good. They claim that demand is there, the Economic Recovery Administration will support some of the domestic fall off, arms to Europe will be a cushion and higher wages and security will buoy up wage-earner spending.

STEEL leaders are aghast at some of the rumors in the trade that steel operation cut backs are arbitrary. What makes it all the more confusing to them is that most steel leaders have only in the past 2 weeks tumbled to what others have known for some time—business of steel users has been declining for at least 4 months. Steel people have been kept in an optimistic state by the high operating rate

and the backlog of orders. All that time incoming business has been dropping off, cancellations have been increasing and general metal activity has been slowing down.

The present outlook in steel is nothing to make either steel or labor people happy. The operating rate is dropping fast. Incoming business is off considerably from a year ago. Cancellations are not fading—they are increasing. The possibility of a long coal tieup is causing no anxiety among steel users. Not much, if any, thought is given to a remote chance of a steel strike.

Major steel firms have enough coal above the ground to keep operations at last week's level for 70 days. If a tieup lasted too long it would be necessary to cut back—for conservation purposes—after 45 days of full output. But the real crux is that the operating rate is slipping each week. As it goes down the amount of coal and coke stocked looms that much bigger in case of an extended tieup. It now looks as if the steel industry could easily weather a complete coal shutdown for 2 months before any drastic steel cutbacks would come. By that time lack of steel business might be doing more than lack of coal to keep output down.

THE steel ingot operating rate this week is off $2\frac{1}{2}$ points to 86.5 pct of rated capacity. In some ways this rate is misleading. All firms are not up to that activity. Larger steel plants are still doing very well this week but some smaller plants are having tough going—with no sign that it will be any easier soon.

It now looks as if the "testing" period on steel operations will come in the middle of July. If the decline in output is still kept within the bounds of a few points a week no serious dip is expected in the near future. But on the basis of present business at plants of steel users the ingot rate may go to 75 pct sooner than most steel people thought it would. Whether it will go much lower than that depends on general business conditions. There are quite a few steel people who have their fingers crossed.

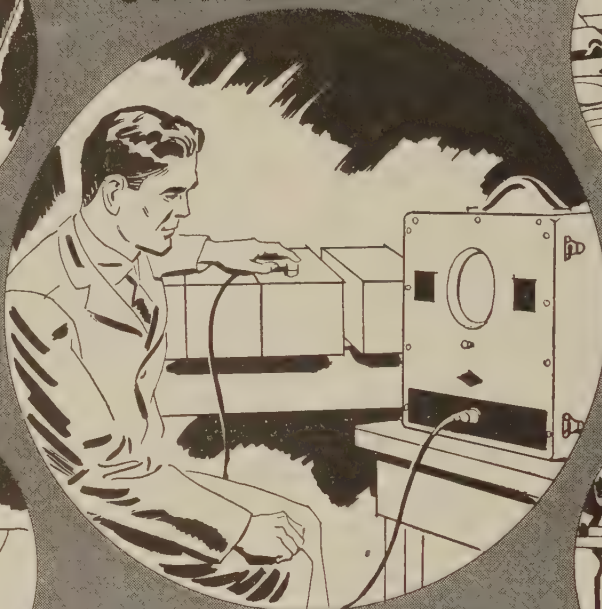
Those who had looked for a stronger scrap market got another jolt this week. Not only is business dull but prices are lower. Where they are not actually lower on the basis of sales there is no strength to talk about in the market. No. 1 heavy melting is down an average of 75¢ a ton at Chicago and at Philadelphia it is off an average of \$1.50 a gross ton. This has cut THE IRON AGE steel scrap composite to a new low this week of \$20.92, off 75¢ a ton from last week—and down \$22.08 a gross ton from the high earlier this year.

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ADDRESS DEPT. A-76

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Tests Scheduled Soon on Stainless Steel Coal Conveyor Belts

Pittsburgh

• • • Four stainless steel coal conveyor belts will soon be tested in a program that may open up a 2500-ton a year market for stainless steel strip. It would also cut coal mining costs. If the practice proves the theory stainless belts will be tough competition for rubber in certain applications. Preliminary tests indicate these chief advantages over conventional belting: (1) Lower first cost (a third to a fourth the price of rubber); (2) longer life in some applications; and (3) less horsepower per ton of coal moved.

The development is not cut and dried. There are still some problems to be licked and failure to solve any one of them might jeopardize the whole project. However, engineers on the belts believe they will be able to take all the hurdles they see before them now. The idea is not new: The Germans began using stainless conveyor belts in 1941. Hundreds are being used now in bakeries and in chemical, glass and plastics plants. What's new is their potential use in American mines in long sections.

Bituminous Coal Research, Inc. originated the project in this country through its Mining Development Committee. BCR is a developmental organization financed by leading commercial and captive coal mine operators, companies which produce 50 pct of the nation's deep-mine coal. Once started, BCR's Mining Advisory Group, made up of 12 coal company chief engineers and operating men, accumulated the German data. Then BCR, through its Huntington, W. Va., office began coordinating the experimental work.

While all stainless steel producers are interested, not all are working on the project though the results will be shared. Allegheny Ludlum Steel Corp. has made a belt for Joy Mfg. Co. which will set it up and test it above ground at its New Philadelphia, Ohio, plant. Goodman Mfg. Co., will test a U. S. Steel belt at its Chicago plant.

The first test, however, will be of an Allegheny Ludlum belt at a

Success Would Open a Wider Market for Strip; Lower Coal Mining Costs

• • •

By GEORGE F. SULLIVAN
Pittsburgh Regional Editor

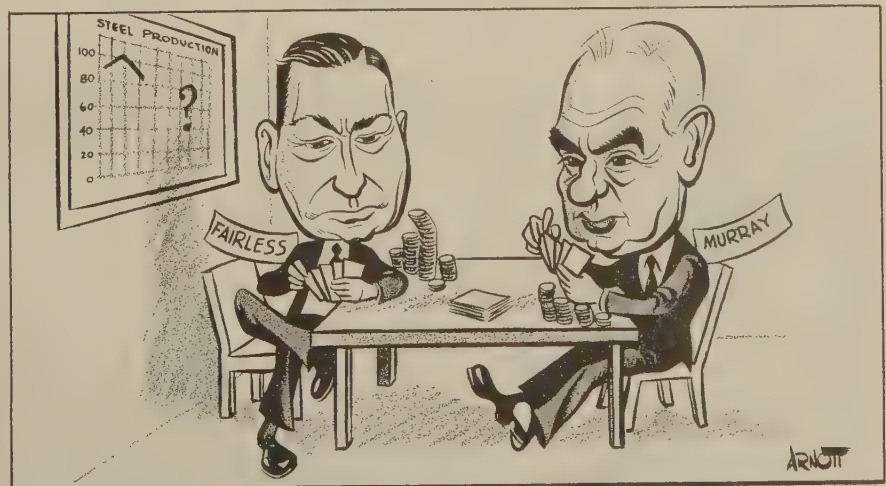
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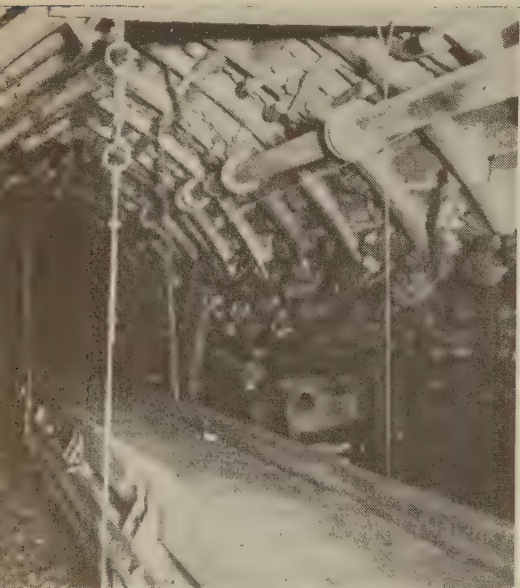
West Virginia mine. This test is expected to start early in July. A third mining machinery manufacturer, Jeffrey Mfg. Co., Columbus, Ohio, is also reported interested. U. S. Steel's Cyclone Fence Div., which makes rubber belting, is expected to handle this type project for Big Steel. Its first installation will probably be in the corporation's Lynch, Ky., mines.

Lower initial cost is one, but not the only advantage claimed for stainless belting. A 20-gage type 302 stainless belt 30 in. wide costs about \$2 per running foot. Prices on suitable rubber belting in this width start at \$6 per running foot; some companies buy a better grade at \$8.

Weight saving is important. The weight of 2000 ft of good rubber belting 30 in. wide is about 45 tons against 9 tons for a stainless belt. In addition to its weight the rubber belt stretches about 10 ft per 1000 ft on starting. This involves a spring or elastic action which consumes a lot of power. Stainless belting will stretch only about 1 in. per 1000 ft on starting. Together these two savings might mean that a 10-hp motor could do the work formerly done by a 40-hp unit. While motors won't be

Nothing Wild





STAINLESS BELT: This photo, taken in a deep mine in the British zone of Germany, shows a flat stainless steel belt. The dents show the amount of abuse this type of belt can take. (Photo courtesy Mining Development Committee, Bituminous Coal Research, Inc.)

replaced on existing conveyors there would still be a power saving.

Rubber belts have been known to burn. They burn slowly but give off fumes to such an extent that West Virginia now requires they be on neutral ventilation to prevent spread of the fumes. This increases mine preparation costs and would undoubtedly be eliminated where a steel belt were used.

Among the problems now being studied by the engineers are belt thickness, troughing, tracking, arrangement of idlers, pulley design and diameter, belt joints and edges. Some of the stainless belts

are 20-gage and some 22-gage. An even lighter gage would be possible from the strength viewpoint but it is believed it might dent badly, particularly when used as a gathering belt on which newly mined coal is dumped in the passageways. However, a fair amount of denting is not harmful.

Idler rolls will probably be used in this country although the Germans used coil spring rollers on their conveyors—possibly because of materials shortages. The springs bowed under the load being transported and made a trough of the belt. But some American engineers fear that the springs might bounce and keep the belt from tracking smoothly. Besides, it is hoped to install the belts on present conveyors with a minimum of accessory changes.

There is still some question about the correct ratio of pulley diameter to belt thickness and whether pulleys should be concave or convex. Some joints have been welded but 1/32-in. diam stainless rivets are being tried on the theory they might be easier to use in the field. The sharp edges of a steel belt are a hazard which may have to be overcome by blunting or beading the edges. Two types of stainless belts are being considered, one designed to run flat, one designed to trough.

The type of stainless steel to be used is still being argued. Type 410 may get the nod over type 302, not because it is cheaper but because being non-austenitic, it is not work hardening.

Provided these and a few more problems can be licked the stainless producers will have a cheaper belt that should outlast rubber.

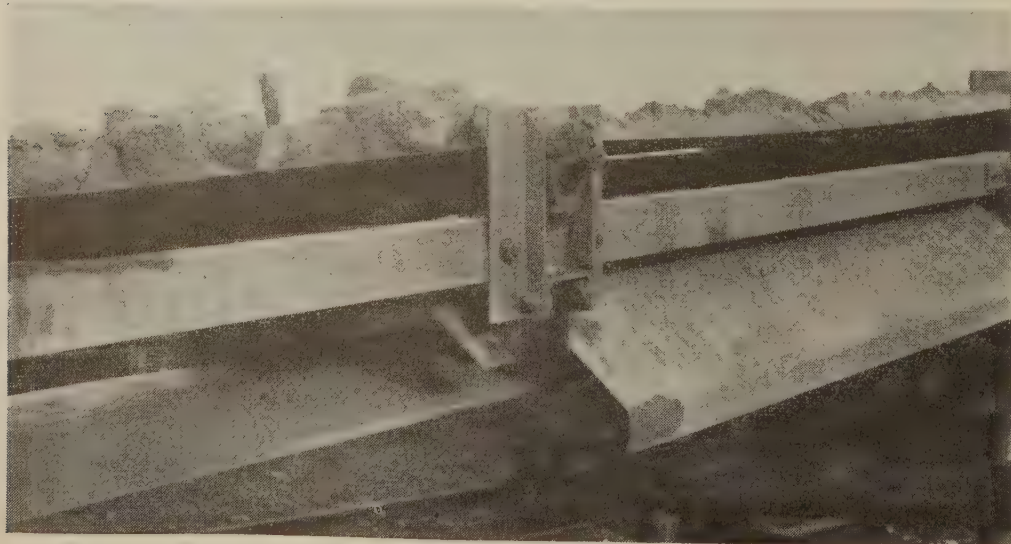
Most rubber belts do not wear out in coal mines, they rot or tear in places. The rotting is due to acid water, to which stainless is practically impervious.

If the new belting is successful operators will want to splice it to rubber as replacement of sections of rubber belting is required. A joint for this purpose is still to be approved.

In replacing what the coal people refer to as a belt section, the mine operator will save about \$13,000 if he can use stainless steel. Some 20 to 30 working belt sections are used per million tons of coal mined. Last year some 580 million tons of bituminous coal and lignite were mined. On somewhat less than this basis the potential market for stainless steel conveyors has been estimated at 2000 to 3000 tons a year.

Some rubber belt makers are concerned about possible development of a successful stainless steel belt. But just as steel helped rather than hurt cast iron, the long term effect of such a development is seen by its backers as a boon to the whole conveyor business. They admit too that the stainless belt would not always be interchangeable with rubber and don't expect it to be used everywhere.

In fact stainless steel sales executives don't want to talk about belts and don't care to sell steel for them right now. They feel that unless and until all the bugs are worked out anyone who buys stainless strip for a conveyor may run into trouble. Working with Bituminous Coal Research engineers and with conveyor builders they hope to be able to have a good belt on the market in less than a year.



HAULING GOB:

This troughing type stainless steel belt, running on coil spring troughing rollers, is hauling rock and refuse back into a German mine. Germans replace this gob to prevent the surface from dropping as well as to control the roof during mining. (Photo courtesy Mining Development Committee, Bituminous Coal Research, Inc.)

WAA Approves Sale Government Property To Ohio Steel Foundry

Washington

• • • War Assets Administration has approved sale of the government-owned facilities of the Ohio Steel Foundry Co., Lima, Ohio to that company for \$1,050,000.

Ohio Steel Foundry had been operating the facilities under lease since 1946, and the effective date of the sale was placed at Jan. 1, 1949.

Under terms of the sale Ohio Steel Foundry will pay 20 pct down, with the balance payable in quarterly installments over a period of 15 years with interest at 4 pct per annum.

The property originally cost the government \$4,797,434. The sale represents approximately 71 pct of the fair value WAA had placed on the property.

WAA pointed out that the facilities are highly scrambled and depend to a large extent on Ohio Steel Foundry's own plant for operation. The wartime plant has been reconverted to the production of steel rolls and a large amount of the original equipment has been sold.

Under terms of disposal, the property is subject to the National Security Clause, and the sale will be reviewed by the Dept. of Justice in the light of existing anti-trust laws.

Last Amount of Marshall Island Scrap Sold by OFL

Washington

• • • Acceptance of a high bid of \$31,000 for an estimated 94,000 tons of ferrous, nonferrous and miscellaneous scrap materials in the Marshall Islands has been announced by the State Dept.

This disposes of the last significant amount of surplus held by the Office of Foreign Liquidation which is scheduled for liquidation as of June 30.

Successful bidder for the scrap was T. Carr of Sydney, Australia. A previous offer last January of \$6400 had been rejected. Under terms of the sale, it will be resold for shipment to the United States.

Harry Moses Chosen Coal Czar

By TOM CAMPBELL

News-Markets Editor

New York

• • • The coal industry may soon have a czar—if premature information on the plan does not blow it up. For years the United Mine Workers—sic Mr. Lewis—have been able to benefit greatly by the dissension in the ranks of coal operators. For years also attempts have been made to put up a common front with Mr. Lewis. This was not always possible—which meant that John L. got pretty much what he wanted.

The recent death of Charley O'Neill of New Rochelle, N. Y., who had for years been the coal industry spokesman, opened up the solid ranks of coal men. It left the door wide open for split and conquer—a move Mr. Lewis knows how to use. After much discussion of who was the man for the job, coal operators, representing more than 300 million tons of coal annually, agreed that it had to be Harry M. Moses.

The reason why Mr. Moses was picked is simple. He is the only man among hundreds who has the complete confidence of all coal people. Mr. Moses, who has a good berth as president of H. C. Frick Coke Co., U. S. Steel subsidiary, does not need the job as coal coordinator or anything else. He has had a brilliant career. This despite the fact that he was working in the shadow of Tom Moses, his father, who was once the head of U. S. Steel's coal empire and one of the first industrialists to negotiate with Mr. Lewis. It was Tom Moses who fostered the first steel contract signed by U. S. Steel when Mr. Lewis was head of the CIO in 1937.

Harry Moses came up the hard way. He has the confidence of Mr. Lewis—even though it be reluctant. He has the good will and appreciation of the northern operators—and the southern operators. Reports that the southern coal men are violently opposed to the coordinator job are not entirely factual. Some favor it and some

don't. It is not true that Mr. Lewis has given the setup his blessing. If anything, he hates to see it come. It might also be that John L. can do nothing about it. He has been the gainer because of disputes over wages and pensions among coal operators.

Reports that U. S. Steel is strongly backing the appointment of Mr. Moses as a coal czar for its own good are without foundation. There is nothing U. S. Steel would like better than to have Harry Moses keep his present job of running the corporation's mines. The decision to take the job was left entirely to Mr. Moses.

One thing is certain. When and if Mr. Moses takes the new job he will have his own way after all parts of the industry have had their say. He knows all the weaknesses of the coal industry. He knows where they have hurt themselves with the public and where they have lost out in bargaining. He knows the ropes. The operators know this. That's why they picked him. And that's why if he takes the job a new phase will open up for the United Mine Workers—and Mr. Lewis.

J. Frederic Byers Dead

Pittsburgh

• • • J. Frederic Byers, chairman of the board of A. M. Byers & Co., Pittsburgh, died June 11 in Roosevelt Hospital after a brief illness. He was 67.

In addition to heading one of the nations largest producers of wrought iron pipe, Mr. Byers was a member of the executive committee and a director of Westinghouse Air Brake Co. He was also a director in the Union Switch and Signal Co., the Mellon National Bank and Trust Co. and the Western Alleghany Railroad.

He was also a trustee of the Carnegie Institute, Pittsburgh; the Carnegie Institute of Technology and the Carnegie Library.

Industrial Briefs . . .

• **NOW DR. CLASTER**—Joel Claster, executive vice-president of Luria Bros. & Co., Inc., Philadelphia, has been awarded a degree of Doctor of Commercial Science by Dickinson College, Carlisle, Pa.

• **SCHOLAR WINS**—Ellis Hoopes Maris, Jr., student at S. Horace Scott Senior High School, Coatesville, Pa., has won the first Scholarship Grant given by Lukens Steel Co. The award carries a stipend of \$1000 a year, for 4 years, toward a college engineering degree.

• **GOLDEN JUBILEE**—On July 17 the Thew Shovel Co., Lorain, Ohio, manufacturers of power shovels and cranes, will be celebrating their fiftieth anniversary as a corporation.

• **NO ESCAPE**—Oakite Products, Inc., New York, has announced the marketing of a new material which produces a dense foam on acid pickling solutions. It is used to provide a seal against the escape of acid fumes.

• **SERVING MIDWEST**—Ward Steel Co., Boston, has announced the completion of a new warehouse at 3042-58 W. 51 St., Chicago, specializing in the distribution of tempered and polished spring steel.

• **NEW MARKET**—The Bridgeport Brass Co., Bridgeport, Conn., has opened a new sales office in the Dwight Bldg. in Kansas City to handle the sale of all their products. The new office will be under the direction of James G. Miller.

• **GIFS GROUP**—The Gray Iron Founders' Society has organized in Salt Lake City a local management group of gray iron foundry executives from Provo, Ogden and Salt Lake City. Jack F. May, Lundin & May Foundry Co., Inc., Salt Lake City, was elected chairman and Jack N. Carter, American Foundry & Machine Co., Salt Lake City, was made secretary.

• **EXHIBIT ON WHEELS**—A new direct approach to industrial merchandising is Miller Motor

Co.'s "College of Cylinder Knowledge" traveling exhibit that goes from plant to plant giving information and demonstrations of the company's air and hydraulic cylinders in actual operation.

• **NEW MONIKER**—The Watch-Motor Mainspring Co. Inc., New York, manufacturers of mainsprings and industrial springs has announced the change of its firm name to Sandsteel Spring Co. Inc.

• **EUROPEAN BRANCHES**—International Meehanite Metal Co., Ltd., London, has announced the licensing of several new plants for the manufacture and sale of Meehanite castings. They are: N. V. Holland, Bergen-op-Zoom, Holland; N. V. Wilton Fijenvord, Schiedam, Holland; and Officine Fonderie Meccaniche Oggionese Arturo Carniti, Oggiono, Italy.

• **LOTS OF JEEPS**—Announcement has been made that a contract for jeeps and concurrent spare parts amounting to more than \$12 million has been awarded by the U. S. Army to Willys-Overland Motors, Toledo.

• **MDNA OFFICERS**—The Machinery Dealers' National Assn., Chicago, has elected Frank J. Lunney of Philadelphia, president. Joseph T. Weiss, Interstate Machinery Co., Inc., Chicago, was named first vice-president; William H. Sharpe, Machine Tools Sales Co., Philadelphia, second vice-president; and Alfred J. Weisbecker, Rosenkranz, Weisbecker Co., New York, treasurer.

• **MORE GRINDERS**—Mattison Machine Works, Rockford, Ill., manufacturers of grinders, has announced the purchase of the line of production grinding machinery formerly made by the Hanchett Mfg. Co., Big Rapids, Mich.

• **CRANE AGENT**—The Acme Equipment Co., Detroit, has been appointed a representative of the Ohio Locomotive Crane Co. of Bucyrus, Ohio.

New England Business Men Express Confidence In Their Own Future

Manchester, Vt.

• • • **New England manufacturers** have expressed confidence in the status of their present and future business. This was recently revealed at the 95th quarterly meeting of the New England Council by Dr. Alfred C. Neal, director of research for the Federal Reserve Bank of Boston. Of the first 450 manufacturers responding to a questionnaire, 78 pct thought that their companies would fare as well as at present or would improve during the next 5 years.

"The fact that so large a proportion of the manufacturers expressed confidence in their own future augurs well for the future of the New England economy," Dr. Neal asserted, "especially in view of the well-known long-term decline of manufacturing in New England relative to manufacturing in the nation."

At the same time, he reported that the manufacturers were somewhat less optimistic about the future of their industry in New England than the future of their own companies. Some 63 pct of those interviewed thought that their industry would hold its own or improve.

A larger proportion of manufacturers expected a decline in business for the full year than reported a decline during the first quarter. Reporting on sales for the first quarter, 59 pct stated they had suffered decreases, 29 pct reported increases and 11 pct unchanged. In estimating business for the full year, however, 65 pct predicted decreases, 17 pct increases and 15 pct unchanged.

More than two thirds of the manufacturers covered by the survey thought they had done as well or better than their competitors during the first quarter of 1949 while only 11 pct thought they had done worse. These impressions, said Dr. Neal, do not agree with some of the statistics measuring the total performance of the manufacturing economy. The drop in employment in the New England branch of most industries was greater than the national average drop in this period. There is obviously some discrepancy," he said.

Appliance Industry Makes Coordinated Effort to Stimulate Sales

Chicago

••• Under the auspices of the American Washer & Ironer Manufacturers Assn., National Home Laundering Week was launched recently under the slogan of "For family washing, there's no place like home." Thus a portion of the appliance industry kicked off on the biggest advertising and sales promotion splurge of the decade. It's replete with radio, newspaper and trade magazine spreads, plus window display contests all mixed with a liberal portion of carnival atmosphere and good old fashioned huckstering.

Why the splurge? For a full year the appliance makers have been independently doing everything to stimulate sales, keep production levels from slipping, etc. This recent effort is merely translating into action all the words and plans into a coordinated effort to sell. This campaign, merchandisers here believe, is but a prelude to what's coming not only in the rest of the appliance field, but all consumer durable goods.

Manufacturers of all types of appliances are pessimistic about their markets for the balance of the year. Household washing machine sales slipped 23.3 pct in April from the March level, and are down 51 pct in April this year compared to April 1948. Factory sales of ironers show a similar decrease. Now, this group of steel users, representing 90 pct of all washer and ironer makers, are in an all out sales effort. Some don't expect results of the promotion to cause the market to reverse its downward trend, but others told THE IRON AGE they might surprise everybody and increase their sales for the balance of the year.

Production of appliances across the board picked up in April and May compared to the three preceding months. However, production is still far below what manufacturers consider a good business level. Refrigerator and stove sales continue to drop. The largest maker of gas stoves in this area is trying to peddle 6000 tons of sheets because his inventory compared to order backlogs keeps looking worse. Obviously, this manufacturer doesn't expect an upturn in stove sales very soon.

Retail outlets report price re-

Production, Sales Slip While Consumer Is Reluctant To Pay High Prices

By D. I. BROWN
Chicago Regional Editor

assistance is terrific. Customers all want the new automatic washers, dryers, two temperature refrigerators, dishwashers, etc. but they don't want them badly enough to pay the present prices. Credit purchases are on the increase in this field, but statistics still show most people have the cash—they just won't let go of it. One Chicago concern which had a bad January and February, dropped the price of their automatic washer from \$230 to \$190 in March. Sales in April and May immediately shot up.

Retailers report that a recent sales hurdle encountered is television. Prospective customers in cases are buying TV sets instead of appliances. They need the appliances, but to a great extent they have given TV sets priority. An average television set costs as much as most appliances and the average customer can't buy both items at the same time.

From a customer's viewpoint, farm implements are in a somewhat similar condition. The farmers have the same buying complex. They aren't buying ahead. They don't go into town to look at a combine or tractor until they need it. When they decide to buy they want it now, not tomorrow, and at present deliveries are prompt on almost all implements. Further, farmers are looking for price revisions in farm machinery.

Order backlogs by implement makers are holding up well in combines, pickers, balers and large tractors. The output of the other farm machinery has slipped about 5 to 10 pct in the last 60 days. Small tractors aren't moving too well. The chief reason is that such items have to really be sold. So far the dealers have been doing well enough so they haven't had to get out and push the sales of small tractors. Implement sales executives expect them to have to do just that, and it might be very soon.

With the exception of dealers handling products of a few big implement makers, inventories of most machinery in dealers' hands are not yet built up to standard. Implement officials here believe all inventories will be filled by fourth quarter. By early next year the tough competitive fight now going on in appliances is expected in the implement field.

ULTRA MODERN: The use of centrifugal casting plus vacuum casting is employed in the plant of Electronicast, Inc., Chicago. The large centrifuge is shown in the center, the vacuum machine is located just behind the centrifuge. This company uses polystyrene patterns in place of wax in making investment moldings.



Tito Between Two Economic Worlds Western Nations Hesitating on Credit

Rome

• • • Marshall Tito's declaration of independence from Moscow has left him economically between two worlds. Loss of capital equipment from Russia is already proving a serious handicap. But the western nations appear in no hurry to replace the Russian bloc as chief suppliers for Yugoslavia's 5-year plan.

This long range plan is designed, among other things, to develop heavy industry in the country. This includes steel. Plan calls for equipping the new steelworks of Dubrov to produce half a million tons per year. Also included is an ambitious oil development plan.

Tito's 5-year plan is partly aimed at ending what he regards as Yugoslavia's colonial status in international trade. It is significant that only 8 pct of the development program is devoted to agriculture, while there is no section devoted to foreign trade.

To effect this industrial development will require large sums of money. Tito wants complete plants. And he wants them on credit. He has asked the International Bank for a loan of \$20 million. But this—even if granted—will be only

a drop in the bucket, compared to what he needs. It has been estimated that both the oil and steel projects will require credits of more than \$100 million.

At this writing his prospects don't look too bright. Britain is not in a position to give credit. Moreover, many in England are opposed to granting credit which might eventually cause a decrease in the type of trade that country wants.

Tito's best security against credit is copper. About half of crude copper production is available for export. Before he pulled out, Russia took about 75 pct of Yugoslavia's copper. During the past several months exports to the U. S. have increased sharply.

Recent trade agreements with France and Germany will provide some capital equipment. But not nearly enough. The United States government so far has not officially considered extending any credit to Tito. Still, unofficial or private credit might eventually be made available.

It is known that U. S. firms are interested in supplying capital goods for both the oil and steel developments. They have made on-

the-spot surveys of equipment needed on these jobs. They are anxious to sell, provided Tito can buy. But he needs credit, and has no immediate hope of getting it through official channels.

This time lag is working against Tito. Maybe he will get the job done in a different way. Maybe he, or the firms who wish to sell to him, will be able to obtain private credit to finance his plan. Otherwise he appears to be standing between two worlds while time runs out.

GE Head Cites Factors Preventing Sharp Drop

Atlantic City, N. J.

• • • The present industrial decline in production may continue until the second quarter of 1950, but business may again reach the high level of 1948 by the end of 1951, according to Charles E. Wilson, president of General Electric Co.

Speaking before the 17th annual convention of the Edison Electric Institute, Mr. Wilson said that it was not expected that the present decrease in industrial production would exceed 15 pct, as compared to last year, before production again turned up. He cited the lack of "great speculative excesses in inventories and the stock market," increased government spending, and the piecemeal readjustment of production and prices as factors which would prevent any drastic decline.

"With the threat of higher taxes and increased government spending, the customers who compose our market will not support further price increases. Therefore, the only possible result of increased labor costs at such a time would be to put some real iron in the public's decision not to buy what we have for sale, and that will mean curtailed production and unemployment.

"A little statesmanship on the part of union leadership at this time would help a great deal and benefit everybody. After all, they have done more than well by their 'special interests' in the years since the end of the war. They can't go on forever diluting the value of money."

ALL-ALUMINUM BRIDGE: *Fabrication of the much-discussed all-aluminum highway bridge for Arvida, P. O. is now nearing completion at the Lachine plant of Dominion Bridge Co., Ltd. Cold riveting with air riveting machines is being employed wherever feasible; pneumatic riveting guns being used only in places where space limitations make it necessary. The 505-ft bridge consists of a single 290-ft arch span with approaches.*



Changes Occur in Export Market for Iron, Steel

New York

• • • Numerous changes occurred in export markets for iron and steel from the United States in 1948, according to American Iron & Steel Institute.

The largest share of the exports went to countries in North and Central America and the West Indies. It was the first year since 1939 that these countries, as a group, had held first place. South American countries ranked second. Europe, for 8 consecutive years the largest consumer of steel exports from the United States, dropped back to its prewar position of the third largest market.

Asiatic countries, which received

the largest percentage of iron and steel exports during 1935-39, were the fourth largest market last year. Africa continued to rank fifth. Australia and Oceania continued to take the smallest part of the exports.

According to final figures by the Dept. of Commerce, 4,697,405 tons of iron and steel were exported from the United States last year.

Receives Safety Award

Portsmouth, N. H.

• • • For the second successive year, Portsmouth Naval Shipyard recently received the Secretary of the Navy's award for an outstanding safety record. The award was for 1948.

Olin Industries Expand

East Alton, Ill.

• • • Olin Industries, Inc., has announced the acquisition of certain assets of two plants for the manufacture of railway fuses and torpedoes, located in Peru, Ind., and Los Gatos, Calif.

The Central Ry. Signal Co., Inc., of Peru, have been manufacturers of railroad fuses over 40 years. The company will now become the Central Safety Signal Div. of Equitable Powder Mfg. Co.

The Pacific Ry. Signal Co., of Los Gatos, has also become affiliated with Olin Industries. Manufacturers of railroad fuses and torpedoes, the California explosive plant will become the Pacific Ry. Signal Co., Inc., division of Columbia Powder Co.

History Shows Talk Won't Bring Steel Prices Down

New York

• • • Steel consumers are talking about lower steel prices. But talk won't bring them down. At least that's what history shows—if history can be believed anymore. A few steel people are fearful that steel now will go like the 1920-1922 period. If it does prices will drop sharply and fast.

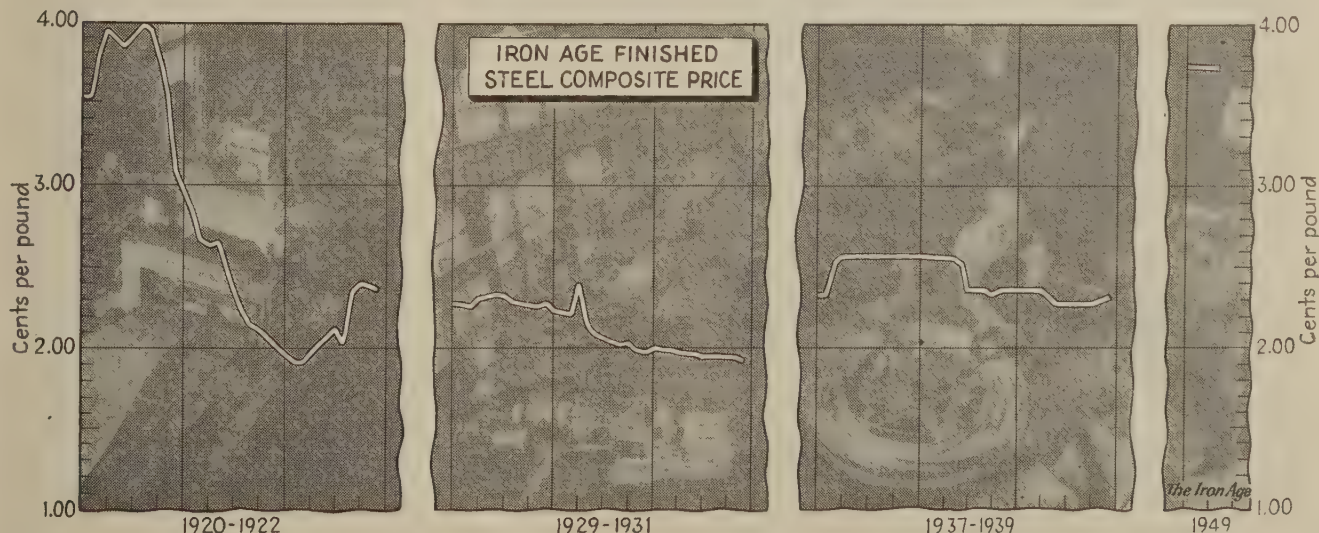
Others think we are in for a repetition of 1937-1939. Hardly anyone can see the 1929 bust repeated now. There are still quite a few steel men who insist that the steel price swing will not go down far from current levels.

From a high in 1920 the steel price composite dropped 52.4 pct in 18 months. But then wage rates were low, there was no strong union and the general economy had fallen apart. The rebound after that period was strong and was the beginning of what was once called the golden '20s.

In the 1937-1939 period the composite price

dropped from its high and kept going down for 26 months when it registered an 11.6 pct dip. But the high in that period was somewhat below the level of the 1920 peak. The depression of 1929-1936 had taken a great toll from steel industry prices.

Today, steel prices—base prices excluding extras—are about 60 pct above the 1939 average and about 52 pct above the 1937-1939 average. They are close to the high of 1920. But most steel people do not believe the sharp, rapid drop of the early '20s will be repeated. They think this because (1) wage rates appear inflexible and are high, (2) the general economy is different than it was then, (3) the entire price level is on a higher scale because of the public debt and national income, (4) steel demand is still far from satiated and (5) government policy won't allow a drastic decline.



British Productivity Team to Study Our Forging Techniques

Washington

••• A British productivity team of workers, technicians and supervisors from Great Britain's drop forging industry will visit 12 American and one Canadian plant during a month's study, beginning today (June 16), of American methods of producing steel forgings.

The 16-man team is making the study under sponsorship of the Anglo-American Council on Productivity and ECA's Technical Assistance Div.

Plants to be visited by the team are: Cornell Forge Co., Chicago; American Brake Shoe & Foundry Co., Chicago; J. H. Williams Co., Buffalo; Moore Forge Co., Springfield, Mass.; Alliance Forge Co., Alliance, Ohio; Chevrolet Div., General Motors, Detroit; Oldsmobile Div., General Motors, Lansing, Mich.; Ford Motor Co., Canton, Ohio; Wyman-Gordon Co., Harvey, Ill.; Wyman-Gordon Co. (two plants), Worcester, Mass.; Harrisburg Steel Co., Harrisburg, Pa., and Dominion Forge & Stamping Co., Walkerville, Ont.

Hugh A. Wallace, managing director, B. & S. Massey, Manchester, will be the leader of the British team. H. A. Whiteley, technical officer of the National Assn. of

Drop Forgers & Stampers, will act as the team secretary. Other members of the team are:

Supervisory group—Harold F. Cooper, Hughes Johnson Stamping, Ltd., Birmingham; Harold M. H. Fox, Smith Clayton Forge, Ltd., Lincoln; Walter E. Jeffreys, Deritend Stamping, Ltd., Birmingham; Michael C. Vaughan, A. J. Vaughan & Co., Ltd., Willenhall.

Technical group—William Butterworth, Mitchell Shackleton, Ltd., Manchester; George L. Cardwell, English Steel Corp., Ltd., Sheffield; George Foster, railway executive, Derby; Leonard Robinson, George Morgan, Ltd., Birmingham; and Jack A. Wragg, Smethwick Drop Forgings, Ltd., Kidderminster.

Workshop group—George Johnson, English Steel Corp., Ltd., Sheffield; Vivian Richards, Blackheath Stamping Co., Birmingham; Evan Smyth, Smith's Stamping Works, Ltd., Coventry; Henry E. Stinchcombe, Daniel Doncaster, Ltd., Sheffield; and John Williams, Deritend Stamping Co., Ltd., Wednesbury, Staffs.

Joins Battelle Staff

Columbus, Ohio

••• Raymond J. Donley, graduate in metallurgical engineering from the Michigan College of Mining & Technology, has joined the research staff of Battelle Institute here. Mr. Donley will be associated with the institute's research in physical metallurgy.

Steel Industry Has 4000 Separate, Distinct Jobs

New York

••• Four thousand or more separate and distinct jobs are found in the steel industry, according to American Iron & Steel Institute. That estimate comes through analysis of a study of jobs in the industry made under the direction of the Committee on Industrial Relations of the Institute.

About 30 separate departments were covered in the study. A total of 5030 separate descriptions were made for the jobs selected from those 30 departments. Since only typical organizations were described, the actual total number of separate jobs which might be found in the industry could be much more than 5030. The total combined number of common and alternate titles recorded was 13,396. Some estimates indicate that if a complete list of all titles used for all jobs could be compiled, the total would reach 50,000 to 60,000.

During the study, certain jobs, such as foreman, millwright, roller and time clerk, were found in many or each of these departments. When these duplications were eliminated from the total list of jobs, the number of separate and distinct jobs was reduced to approximately 4000. Other estimates are known to have put this total in the neighborhood of 4500 to 5000 separate and distinct jobs.

Only about 10 pct of all the workers in the steel industry can be classified as unskilled. The great mass of the workers belong to the semiskilled and skilled classifications. In addition, there are many thousands of positions in the executive, supervisory, technical and staff classifications in sales offices scattered through the country.

Heads Electric Truck Assn.

Pittsburgh

••• William Van C. Brandt, of Philadelphia, one of the pioneers in the battery-powered industrial truck industry has been appointed managing director of Electric Industrial Truck Assn. Active in the EITA for the past 25 years, Mr. Brandt has resigned his position as manager of railway and motive power sales for the Electric Storage Battery Co. of Philadelphia to accept the new post.

Coming Events

- | | |
|-------------|---|
| June 16-17 | Malleable Founders Society, annual meeting, Hot Springs, Va. |
| June 20-22 | National Assn. of Purchasing Agents, annual convention, Chicago. |
| June 27-30 | American Electroplaters Society, annual meeting, Milwaukee. |
| June 27- | American Society for Testing Materials, annual meeting, At- |
| July 1 | lantic City, N. J. |
| July 11-16 | Concrete Reinforcing Steel Institute, annual meeting, White Sulphur Springs, W. Va. |
| Sept. 14-16 | Porcelain Enamel Institute, annual forum, Columbus, Ohio. |
| Sept. 25- | American Institute of Mining & Metallurgical Engineers, |
| Oct. 1 | midyear meeting, Columbus, Ohio. |
| Sept. 26-28 | National Electronics Conference, Chicago. |
| Oct. 3- 5 | American Coke & Coal Chemicals Institute, annual meeting, Skytop, Pa. |
| Oct. 10-14 | American Society for Testing Materials, West Coast meet- |
| | ing, San Francisco. |
| Oct. 12-15 | Electrochemical Society, semiannual meeting, Chicago. |
| Oct. 13-15 | Foundry Equipment Manufacturers Assn., annual meeting, |
| | White Sulphur Springs, W. Va. |
| Oct. 17-21 | National Metal Congress, Cleveland. |
| Oct. 24-26 | American Gear Manufacturers Assn., annual meeting, Chi- |
| | cago. |
| Oct. 26-28 | National Metal Trades Assn., annual convention, Chicago. |
| Oct. 27-28 | Gray Iron Founders Society, annual meeting, Chicago. |

Wire Industry Faced by Inventory Liquidation and Price Testing

Cleveland

••• Demand for wire and wire products, about a 6.5 pct segment of total annual steel shipments, is, like the rest of the steel market, slowly sliding.

The decline in demand for wire and wire products began on the West Coast about a year ago, hit New England last March and spread rapidly during the second quarter. Geographically, present demand is in direct proportion to the distance from the automobile industry; the farther away from Detroit, the worse the orders get.

Thus, after 8 years of war, quotas and hysteria, the customer in the wire and wire products business is once again always right.

What the wire industry is doing today could be normal, but some producers would hate to think so for a number of reasons, including some of the following:

New business is off 12 to 40 pct from the first quarter, depending upon the producer.

Price-wise the wire market is confused with some producers reducing prices to meet competition of major producers, an action always vaguely upsetting to the trade. Premium stuff is gone.

Price testing by consumers is increasing. Also, if and when the steel industry gets below an 80 pct operating rate, the pressure for price reductions within the industry will be tremendous.

Lead time is out on orders. Business is not all in the first of the month or the first of the quarter, as it used to be. Mills are booking on a 15-30 day basis.

Cancellations, not big but numerous, are coming in. Some producers report the cancellations as amounting to less than 10 pct of bookings; others, up to 25 pct.

Requests for deferred delivery are common practice. First quarter shipments have been deferred to the second or even the third quarter.

Many wire and wire products producers report third quarter bookings by no means as easy as the second and require serious scratching, and third quarter and fourth quarter prospects are gloomy.

A major factor in the difficulties producers encountered in booking the third quarter is con-

Producers Enter Competitive Market With Consumer Demands Being Met

By BILL LLOYD
Cleveland Regional Editor

sumer anticipation of a steel price cut.

Prime reason for the drop in wire demand, according to both producers and consumers, is a liquidation of inventory. Many consumers, manufacturers and jobbers, bought without rhyme or reason, largely because they were suddenly able to get as much tonnage as they desired and as a result, some of these inventories will run through August.

As a new wrinkle, manufacturers in some districts are trading wire products to equalize inventory.

A summer drop in farm wire and other products appears to be shaping up, but it is hoped that a pickup in industrial wire, which

trade sources say is on the way, will take up the slack. (Users of industrial wire are among the principal consumers liquidating inventory.)

Some producers report that failure to make immediate or quick delivery is a major cause of cancellations, which leads to another problem some producers are up against, a switch in mill source by consumers.

Many consumers were unhappy over their treatment under the postwar steel quota system and their first opportunity to make a change has developed in the present wire market.

Some producers are getting business which they had to turn down during the war and the reconversion period as a result. Others who can ill afford to lose major accounts have a battle on their hands. Needless to say, all wire producers are on the make for new customers.

Thus, the wire and wire products business is back to seasonal curves or influences or the 1933-39 pattern. Producers face continu-

NORTH OF THE BORDER: A shot of part of the Automotive Bldg. exhibits at the 1949 Canadian International Trade Fair housing machinery, plant equipment, electrical equipment, automotive parts and accessories, building equipment, etc. In the picture are the exhibit of machinery and equipment from Czechoslovakia, France, Canada, United States, United Kingdom and Sweden.



ing decline in demand through the balance of the year, a decline which will probably follow the general business picture.

Production will certainly be higher than any prewar year, but less than 1948. Some producers estimate that wire and wire products shipments will be down 25 pct from 1948.

At the present time, the wire market shapes up something like this: With a drop in the offing, demand for fence and farm wire products is fairly good in the south. Automotive demand is holding up rather well. Manufacturers' wire is off. Wire rope is down. Barb wire, cable, are in easy supply and low demand. Nail and staple demand is spotty, which pretty well characterizes at best the entire wire market situation.

Some producers feel consumer demand for wire has not been satisfied, and that jobbers stocks in several areas are not complete or big. But this view is held by a minority.

With some exceptions, most wire

producers say they were selling up to a month ago about all the steel they could melt without overtime. In March one producer turned out the biggest tonnage in the plant's history. In May, another producer produced more fence wire than in any previous month. But these are exceptions, and destined to be short lived.

While indications are that the wire business will be worse everywhere before it is better, the wire industry knows better than anybody that consumers who bought whenever they could get it during the past 3 years are now buying when they need it.

Buys Duquesne Property

Pittsburgh

• • • The purchase of the land and buildings formerly occupied by Duquesne Smelting Corp., has been announced by W. E. Moore Co. and its associated companies, Pittsburgh Lectromelt Furnace Corp., Pittsburgh Lectrodryer Corp., and West Penn Machine Shops.

Lists Participating Scientists for Annual Metal Show Symposium

Cleveland

• • • A complete list of the participating scientists in the American Society for Metals' annual symposium at the Metal Show has been announced by W. H. Eisenman, the society's national secretary.

Symposium sessions will be held during Saturday and Sunday, immediately preceding the opening of the 31st Metal Congress and Exposition on Monday, Oct. 17, in Cleveland's Public Auditorium. Subject of the 2-day symposium will be "Thermodynamics in Physical Metallurgy."

Fifteen leading metallurgists, mathematicians, physicists and researchers will deliver important papers on different phases of recent developments in this field.

Dr. Clarence Zener, professor of physics, Institute for the Study of Metals, University of Chicago, is organizer and chairman of the symposium series.

Other participating scientists include: P. W. Bridgman, Hollis professor of mathematics, Harvard University; Lawrence S. Darken, research chemist, U. S. Steel Corp.; F. J. Dunkerley, assistant professor of metallurgy, University of Pennsylvania; A. W. Lawson, associate professor of physics, Institute for the Study of Metals, University of Chicago; John Chipman, professor and head of the Dept. of Metallurgy, Massachusetts Institute of Technology; C. E. Birchenall, assistant professor, Dept. of Metallurgy, Carnegie Institute of Technology; Frederick Seitz, professor and head of the Dept. of Physics, Carnegie Institute of Technology; John Hollomon, research associate, General Electric Co.; Charles Wert, instructor, Institute for the Study of Metals, University of Chicago; John Fisher, research associate, General Electric Co.; Morris Cohen, professor of metallurgy, Massachusetts Institute of Technology; Lieuwe Dijkstra, research associate, Institute for the Study of Metals, University of Chicago; D. Turnbull, research associate, General Electric Co.; J. B. Austin, director of U. S. Steel Corp. laboratories.

30 YEARS AGO

THE IRON AGE, June 15, 1899

• "The Los Angeles *Herald* deplores the fact that, just as the discovery has been made of hundreds of miles of oil bearing territory in southern California, the price of wrought pipe 'has gone skyward.'"

• "The Japanese battleship '*Asahi*,' lately launched from the Clydebank yard, Glasgow, is the largest warship yet built."

• "A. B. Wolvin, whose order for four 500 footers for lake ore service has excited more comment along the lakes and among ore men than any recent event in this fast moving day."

• "A movement having a strong support of popular sentiment is on foot in England in favor of

the projected tunnel between Ireland and England."

• "An interesting phase of the labor question in Western rolling mills is reported to be likely to develop over the employment of non-union workmen in the Tudor Iron Works, at East St. Louis, now belonging to the Republic Iron & Steel Corp."

• "Shipment is being made by the Exporters' Assn. of America of 20 locomotives built by the Richmond Locomotive Works to the Swedish R. R., Sweden."

• "It is reported that Charles H. Schaffer of Marquette, Mich., proposes to put in operation the Carp furnace, which has been idle for a number of years. It is a charcoal furnace."

Machine Tool Builders Form New Corporation To Facilitate Selling

Cincinnati

••• American Services, Inc., a corporation to promote sales of machine tools in Latin-American countries, has been authorized here by Ohio Secretary of State, Charles F. Sweeney. New corporation embraces three major Cincinnati machine tool builders, Cincinnati Milling Machine & Grinding Machines, Inc., Fosdick Ma-

chine Tool Co., and Cincinnati Lathe & Tool Co. Other major machine tool builders who are charter members of American Services, Inc. are:

Blanchard Machine Co., Cambridge, Mass.; Cone Automatic Machine Co., Inc., Windsor, Vt.; Heald Machine Co., Worcester; Hydraulic Press Mfg. Co., Mt. Gilead, Ohio; Jones & Lamson Machine Co., Springfield, Vt.; Monarch Machine Tool Co., Sidney, Ohio; National Automatic Tool Co., Richmond, Ind.; and Thomp-

son Grinder Co., Springfield, Ohio.

Chief purposes of the concern are to promote the sale of machine tools manufactured by member companies, to give technical assistance and the servicing and utilization of such equipment and to promote good will trade practices with Latin-American countries. Capital of the corporation will be used to finance the administration of credit so Latin-American purchases can be serviced financially through the Export-Import Bank.

AMERICAN IRON AND STEEL INSTITUTE

Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

YEAR 1949 (Preliminary)

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	7,287,683	101.1	408,552	92.6	487,260	93.8	8,183,495	100.2	1,847,290	4.43
February	6,633,779	102.0	379,698	95.3	467,247	99.6	7,480,724	101.4	1,870,181	4.00
March	7,473,901	103.7	430,176	97.5	483,850	93.2	8,387,927	102.7	1,893,437	4.43
1st Quarter ..	21,395,363	102.3	1,218,426	95.2	1,438,357	95.4	24,052,146	101.5	1,870,307	12.86
* April	7,015,611	100.5	404,095	94.6	365,570	72.7	7,785,276	98.4	1,814,750	4.29
† May	6,984,815	96.9	400,741	90.9	297,872	57.4	7,683,428	94.1	1,734,408	4.43
June										4.29

† Preliminary figures, subject to revision.
* Revised.

YEAR 1948

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	6,770,831	95.6	343,263	77.5	366,784	80.2	7,480,878	93.7	1,688,686	4.43
February	6,247,491	94.4	340,689	82.3	359,837	84.2	6,948,017	93.1	1,678,265	4.14
March	6,845,777	96.6	363,334	82.0	409,659	89.6	7,618,770	95.4	1,719,813	4.43
1st Quarter ..	19,864,099	95.5	1,047,286	80.6	1,136,280	84.7	22,047,665	94.1	1,695,974	13.00
April	5,640,273	82.2	185,140	43.2	399,074	90.1	6,224,487	80.5	1,450,929	4.29
May	6,801,633	96.0	355,659	80.3	423,350	92.6	7,580,642	94.9	1,711,206	4.43
June	6,484,114	94.5	356,907	83.2	424,228	95.8	7,265,249	94.0	1,693,531	4.29
2nd Quarter ..	18,926,020	91.0	897,706	69.0	1,246,652	92.8	21,070,378	89.9	1,619,552	13.01
1st 6 Months ..	38,790,119	93.3	1,944,992	74.8	2,382,932	88.8	43,118,043	92.0	1,657,749	26.01
July	6,348,611	89.8	325,080	73.6	401,826	88.1	7,075,517	88.8	1,600,796	4.42
August	6,633,443	93.6	371,306	83.8	442,085	96.7	7,446,834	93.3	1,681,001	4.43
September ..	6,594,499	96.3	387,259	90.5	443,086	100.3	7,424,844	96.2	1,734,777	4.28
3rd Quarter ..	19,576,553	93.2	1,083,645	82.6	1,286,997	95.0	21,947,195	92.7	1,671,530	13.13
9 Months	58,366,672	93.2	3,028,637	77.4	3,669,929	90.8	65,065,238	92.2	1,662,372	39.14
October	7,120,753	100.5	409,657	92.5	466,485	102.0	7,996,895	100.1	1,805,168	4.43
November	6,925,043	100.9	411,161	95.9	461,354	104.2	7,797,558	100.8	1,817,613	4.29
December	6,927,689	98.0	393,717	89.1	459,373	100.7	7,780,779	97.7	1,760,357	4.42
4th Quarter ..	20,973,485	99.8	1,214,535	92.5	1,387,212	102.3	23,575,232	99.5	1,794,158	13.14
2nd 6 Months ..	40,550,038	96.5	2,298,180	87.5	2,674,209	98.6	45,522,427	96.1	1,732,867	26.27
Total	79,340,157	94.9	4,243,172	81.2	5,057,141	93.7	88,640,470	94.1	1,695,495	52.28

Note—The percentages of capacity operated are calculated on weekly capacities of 1,599,286 net tons open hearth, 99,962 net tons Bessemer and 103,228 net tons electric ingots and steel for castings, total 1,802,476 net tons; based on annual capacities as of January 1, 1948 as follows: Open hearth 83,610,690 net tons, Bessemer 5,226,000 net tons, Electric 5,396,770 net tons, total 94,233,460 net tons.

Steel Output for First 5 Months '49 Sets Record

New York

• • • The steel industry produced 7,683,428 tons of ingots and steel for castings during May, the second highest tonnage ever made in that month, according to American Iron & Steel Institute.

The industry's output in the first 5 months of this year was about 39,521,000 tons, a record. In the 12 consecutive months ending May 31, the production exceeded 92,300,000 tons, an achievement never before equaled in a like period.

Steelmaking furnaces of the industry were operated at an average of 94.1 pct of capacity during May. That was identical with the average of operations during the entire year, 1948. (However, the total capacity of the industry is about 1,887,000 tons higher at present, on an annual basis.)

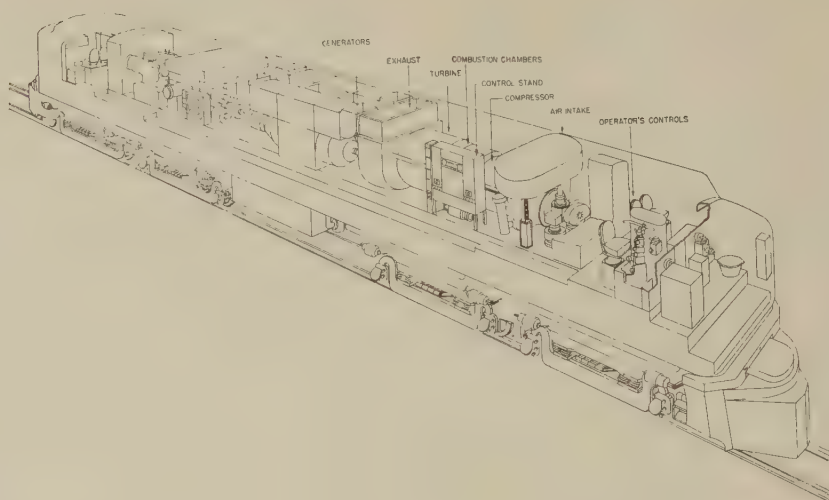
The tonnage made in May was approximately 103,000 tons larger than in May 1948, when furnaces were operated at an average of 94.9 pct of capacity. The highest tonnage ever made in May was 7,702,578 tons during May 1944.

No. 7 for Metal Treaters

Quebec

• • • The Metal Treating Institute held its 7th spring meeting here recently, with Charles H. Hewitt, Dayton Forging & Heat Treating Co., Dayton, presiding. Other officers are: Fred Heinzelman, Jr., Fred Heinzelman & Sons, New York, vice-president; Richard W. Thorne, Bennett Steel Treating Co., Newark, treasurer; and Stewart N. Clarkson, executive secretary.

The technical phase of the session was highlighted by the presentation of several formal papers, including: "What Is Your Break Even Point," by J. R. MacAllister, Syracuse Heat Treating Co., Syracuse; "Typical Costs for Various Processes," by D. M. Knoch, Metro Heat Treat Corp., New York; and "Heat Treatments as Affected by Alloys," by A. E. Bowden, metallurgical engineer, Steel Co. of Canada, Ltd., Montreal.



Gas Turbine-Electric Locomotive Completes Tests

Schenectady

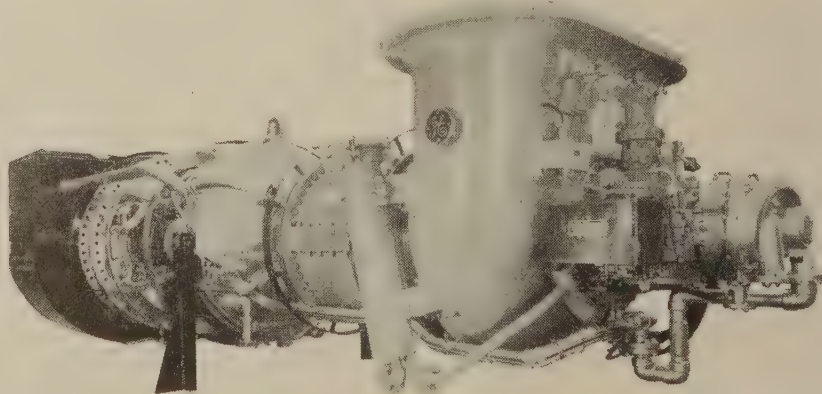
• • • The first gas turbine-electric locomotive to be built and operated in the United States, as Alco-GE 4500-hp unit, has completed preliminary road tests and will see further service soon on Union Pacific R.R.

The preliminary tests were made in the East over a period of several weeks during which the developmental locomotive performed successfully on freight haulage runs. Additional road trials will get under way next month when the gas turbine powered unit is operated in freight service by the Union Pacific.

The locomotive gas turbine differs from the aircraft jet engine in that the gases it produces are harnessed within the power plant and the resultant power is transmitted electrically to drive the wheels, whereas the aircraft engine provides forward thrust from the reaction of its exhaust stream.

The compressor, combustion chamber and turbine are of inline construction. Air is drawn through a compressor into several combustion chambers. Fuel is injected and the mixture burns, raising the temperature of the compressed air. Resulting gasses expand and move at great velocity against the turbine blades, turning the shaft. The shaft drives both the power plant compressor and the generator. Power from the generator is supplied to eight traction motors, each of which drives one of the eight axles.

The gas turbine currently is fired by Bunker C oil. The power plant itself is rated at 4800 hp, with 4500 hp available for traction. Geared for 79 mph, the locomotive carries enough fuel for 12 hr operation at 4500 hp.



Discusses Necessity For Integrated Steel Mill in Southwest

Tyler, Tex.

••• E. B. Germany, president Lone Star Steel Co., in a talk given here before the Rotary Club, charged that "Until January of this year, the southwest has been the stepchild of the American steel industry." This overnight miracle, Mr. Germany declared, happened when big steel realized that the government might grant funds to build a mill in the area. He said that the full page advertisements proclaiming the end of the steel shortage, reams of publicity, radio broadcasts, cocktail parties and personal visits from the heads of big steel corporations were all designed to tell the southwest of the fact that there is now enough steel for everybody.

He traced the beginnings of the steel industry in east Texas from the war days until the present. He told the group that results of surveys made by leading engineering firms have proved that an integrated steel mill in the southwest would be good business, would make a profit and should be built.

The president of the Lone Star

Steel Co. told the group that Texas is the seventh largest consumer of major steel products in the country and that they have everything needed to make steel right in the middle of the market area. This trade area, according to the president of Lone Star Steel Co., consumed 7.55 pct of the total national output. By comparison, the Pacific Coast and Rocky Mountain area consumed 6.16 pct of the national total, Mr. Germany said, and yet "There are three major integrated steel mills in that region."

Mr. Germany criticized the development of some of the foreign iron ore steels that are being readied to supply American steel industry. He recalled that during the last war when one of the steel companies was using nine ore boats to import Cuban ores that during the first 30 days of the war seven of these ships were sunk. He stated he could see no logical reason why domestic ore supplies, and therefore steel production, should not be developed before concentrating on foreign fields where transportation is hazardous in times of national emergency.

Another logical reason for a steel mill in east Texas, the Lone Star executive declared, is the court ruling on f.o.b. mill prices

that has made industry adopt the policy of decentralization in order to get closer to its market. He declared that so far the steel industry as a whole hasn't adopted a far sighted policy regarding decentralization. He charged, "It is still so highly concentrated that the freight still constitutes the major part of the consumers bill. Here in the southwest we are paying a \$5 million yearly premium on our steel because of the centralized nature of the industry."

The group was told that the Lone Star Steel Co. has everything required to build a steel mill, iron ore, limestone, coal, a blast furnace and coke plant to supply the mill. He also emphasized that they have the market for the products of such a mill. "We believe our application for credit with the RFC is based on a sound banking principle; that this will prove to be a good investment for the taxpayers of the country; that it will increase the standard of living in the southwest by increasing our industrial capacity; that it will strengthen our national military establishment by providing a source of materials with which to keep our nation strong."

Army Awards Contracts Totaling \$4.5 Million

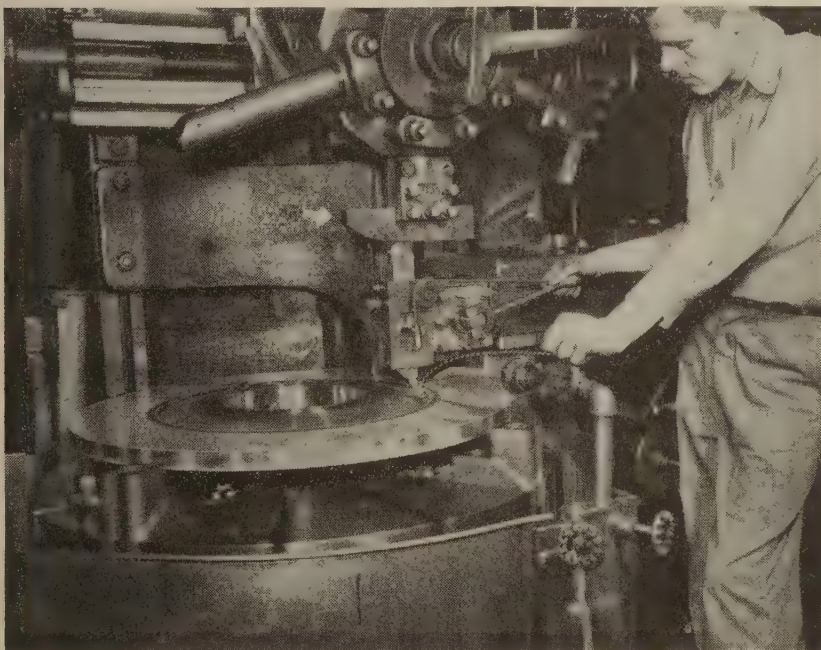
Washington

••• Contracts totaling more than \$4,500,000 for iron, steel and their products were awarded by the Army Dept. during the first week of June. This figure includes only major contracts amounting to \$100,000 or more.

Steel awards included 7934 NLT pig iron, \$2,531,739, Continental Ore Co.; 700,000 barbed wire posts, \$250,160, Buffalo Steel Co.; 2000 tons plus round steel, \$213,246, Bliss & Laughlin, Inc.; and \$131,951 worth of reinforcing bars, Kaiser Co., Inc.

Included among the other metal products contracts awarded were: Sheldon Machine Co., 175 motor-driven lathes, \$190,750; Federal Motor Truck Co., 115 engines, \$256,096; Superior Burner & Furnace Co., tank assemblies, \$122,864; General Motors Truck & Coach Div.; spare parts, \$285,679; Biederman Motors Corp., axles, \$407,651; and, Trico Products Corp., automotive parts, \$110,184.

CONTOURING: Use of a cam block attachment with a turret lathe materially speeds the production of turbine disks at Westinghouse's Sunnyvale, Calif. plant. The disk being contoured in the picture is for a big steam turbine. The cam plate (arrow), which is in contact with the roller, has the exact profile required.



Steel Founders Squeezed Between Firm Steel Price And Falling of Demand

Chicago

• • • At the Second Annual Industrial Relations Conference held by the Steel Founders Society of America at the Drake Hotel, June 9, Thomas H. Shartle, president of Texas Electric Steel Casting Co., said that the average fringe benefits being demanded currently by unions amount to 14.9¢ per hr. Reporting on a survey for the entire year of 1948 taken in 73 foundries, the highest fringe benefits asked by the union on contracts now about to be negotiated was 38.2¢ an hr and the low was 7.5¢ an hr. These fringes include vacations, special holidays, pension and health insurance, unemployment compensation, paid lunch hours, etc.

The average labor wage in these same foundries for the year was \$1.43, the high \$1.83 and the low \$1.02. Overtime pay for the year averaged 7.4¢ an hr, which made

these foundries \$1.66 an hr. This includes shift differentials and other minor charges.

F. Kermit Donaldson, executive vice president of the Steel Founders Society, said that the slump in the steel casting industry has been so sharp that it cannot possibly get any worse. He estimated that most of the country's steel foundries are running about 60 pct of last year's peak operations. Members of the society gathered at the conference represent about 97 pct of the steel casting capacity of the country. Registration for the two day session was 160 men. Mr. Donaldson said that the industry is squeezed between firm steel prices and a softening demand from their customers. Recent strikes in automotive and automotive parts companies have further hurt their production schedules. Mr. Donaldson believes that a stiffening in the prices of raw materials and scrap could stimulate business. This, he said, would give everyone confidence that the bottom of the slump has been reached and production would then pick up.

Truckers Protest Bill Calling for Fixed Rates

Chicago

• • • House Bill 929 now in subcommittee of the Illinois legislature, private truckers declare, would hamstring all private motor carriers in the state. The Chicago Assn. of Commerce's representatives in Springfield plus those from many steel warehouses and other business houses declare the bill is written to protect a very tight monopoly in the hauling business.

Three hearings have already been held before the committee and the fourth hearing held June 7 in Springfield brought forth plenty of opposition to the bill. Through rate making provisions which are to be fixed by a new commission created by the state, all private and contract carriers would have to obey fixed rates and if they didn't they would be out of business.

Independent traffic men in Chicago believe that all interstate movements would be so jeopardized that passage of the bill might seriously hinder the distribution of all goods hauled by truck.

Railroad Shops Closed

Buffalo

• • • The New York Central Railroad closed its East Buffalo car shops June 13. It furloughed 650 workers for an indefinite period, because of a 15 pct drop in traffic, coupled with expectations of a further slump as a result of the one-week shutdown of the coal mines ordered by John L. Lewis.

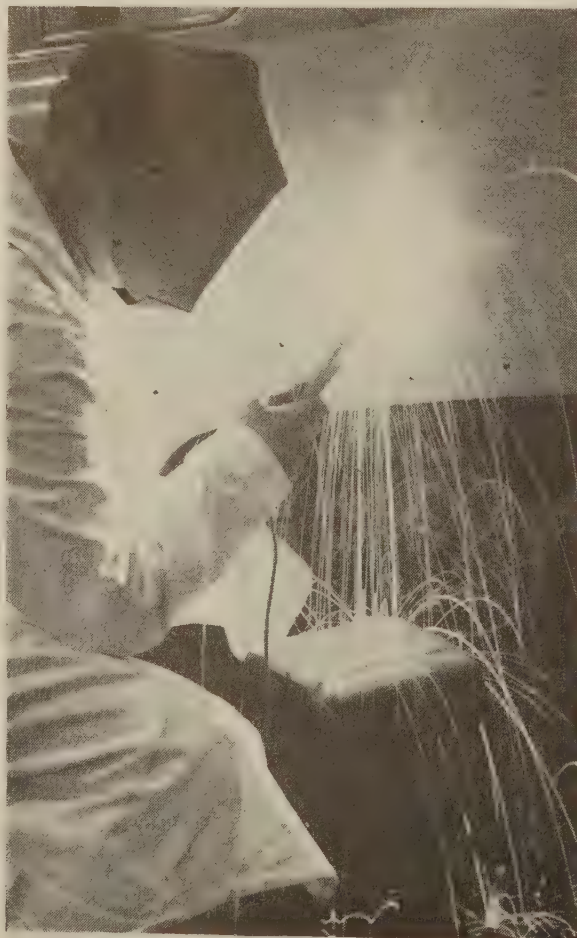
It was the second time this Spring that the shops have shut down.

Receives Swedish Ore

Buffalo

• • • The Lackawanna plant of the Bethlehem Steel Co. has received 40,000 tons of Swedish iron ore, running from 60 to 65 pct Fe, since the opening of the 1949 navigation season via Montreal and the St. Lawrence River.

Another 20,000 tons are reported en route to Montreal for transshipment into smaller freighters for the Lackawanna plant. The ore is used in special types of steel.



NEW WELDER: In the photograph a Ford repairman is using a new "Linc-welder 60" to close a tear in a rear fender panel. The 110-v ac welder plugs into any light socket fused for 30 amp. Ford engineers claim that the use of new tools, equipment and welding techniques on 1949 Ford cars makes it unnecessary to replace any portion of a damaged fender except when a part is actually missing.

Construction Steel . . .

• • • Fabricated steel awards this week included the following:

990 Tons, Oakland, Calif., separation structures, Eastshore Freeway between South City limits and High St., through Fredrickson & Watson, to Bethlehem Pacific Coast Steel Corp., San Francisco.

300 Tons, Brooklyn, N. Y. Shulamith School for Girls to Grand Iron Works, New York.

250 Tons, Woburn, Mass., warehouse for General Motors Corp. to Groisser & Shlager Iron Works, Somerville, Mass.

100 Tons, Sudbury, Mass., new school through S. Volpe & Son, Boston to Bethlehem Steel Co., Inc., Bethlehem.

100 Tons, Skokie, Ill., building for Frigid Fluid Co., to Wendnagel & Sons Co., Chicago.

100 Tons, Bellwood, Ill., Roosevelt high school building to Wendnagel & Sons, Chicago.

• • • Fabricated steel inquiries this week included the following:

455 Tons, McNary, Ore., Oregon shore cofferdam and other structures, McNary Dam, Walla Walla District, Corps of Engineers, Ser. No. Eng-45-164-49-111, bids to July 19.

100 Tons, New Haven, Conn., retaining bulkhead at Brewery St. Channel on harbor front, U. S. Route 1.

100 Tons, Danbury, Conn., 2-span steel I-beam bridge with concrete slab deck over New Haven R. R. bridge.

• • • Reinforcing bar awards this week included the following:

1700 Tons, Madison, Wis., Veterans Hospital through Gus J. Newberg Construction Co., Chicago to J. T. Ryerson & Son Co.

280 Tons, Oakland, Calif., separation structures, Eastshore Freeway between South City limits and High St., through Fredrickson & Watson, to Judson Pacific Murphy Corp., Emeryville, Calif.

275 Tons, Chicago, Kostner St. sewer through Michael Ponterelli Co., Chicago, to J. T. Ryerson & Son Co.

180 Tons, Chicago, Chicago housing project Site No. 5 to George Sollitt Construction Co., Chicago.

155 Tons, Douglas Co., Wash., bridge on PSB 2, Pine Canyon Revision, through Goodfellows Bros., Inc., Wenatchee, Wash. to State Construction Co., Seattle.

105 Tons, Madison, Wis., Hangar, Truax field through Partell Construction Co., St. Paul, to Ceco Steel Products Co., Chicago.

• • • Reinforcing bar inquiries this week included the following:

8000 Tons, McNary, Ore., Oregon shore cofferdam and other structures, McNary Dam, Walla Walla District, Corps of Engineers, Ser. No. Eng-45-164-49-111.

300 Tons, St. Joseph, Mich., memorial hospital building, Pearson Construction Co., Benton Harbor, Mich., low bidder.

250 Tons, Chicago, C. B. & Q. Railroad freight house No. 10, project has been abandoned.

200 Tons, Chicago, 12-story apartment building, project has been abandoned.

190 Tons, Conn., Mansfield Hollow Dam at the Natchaug River. Construction of earth dam and appurtenant structures. U. S. Corps of Engineers project, Boston. Bids due June 22.

170 Tons, Davenport, Ia., St. Luke's hospital.

• • • Sheet steel piling awards this week included the following:

165 Tons, Chicago, Howard St. elevated station for Chicago Transit Authority, to Kenney Construction Co., Chicago.

• • • Steel piling inquiries this week included the following:

3125 Tons, McNary, Ore., Oregon shore cofferdam and other structures, McNary Dam, Walla Walla District, Corps of Engineers, Ser. No. Eng-45-164-49-111, bids to July 19.

135 Tons, Middletown, Conn., 2-span welded girder bridge over New Haven R. R. on Middletown Expressway.

Dielectric Core Dryers May Assist Foundrymen

Milwaukee

• • • A new dielectric sand core dryer has been developed by Allis-Chalmers Mfg. Co. which may enable foundries to streamline their production. The dryer consists of a radio frequency heater, an oven with electrodes, tuning assembly, ventilating system and end conveyors for loading and unloading. Allis engineers claim it is particularly adaptable where resin binders are used and results in improved core quality, increased production, reduced cost, greater flexibility and better working conditions.

A fairly wide range of core sizes can be handled by this method

since the heat is developed uniformly in the core and drying is not dependent on thermal conduction. Time for drying varies from 2 to 20 min depending on the size of the core handled.

With the new equipment, green cores can be placed on the in-feed belt as soon as they are made and dried cores can be taken from the belt to the sorting table or directly to the molding floor without cooling, thus eliminating the need for storage and cooling racks.

When using dielectric heating the heat radiation into the room is negligible and all gasses are exhausted outside the building. The units need only be connected to a power source and full output is available without long warm up periods.

NEW FLAT WASHER STANDARDS

NEW ASA, and SAE STANDARDS ADOPTED BY LEADING AUTOMOTIVE MANUFACTURERS

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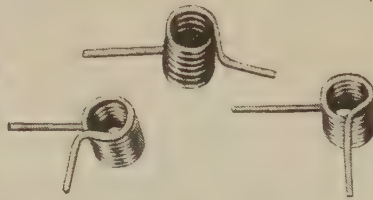
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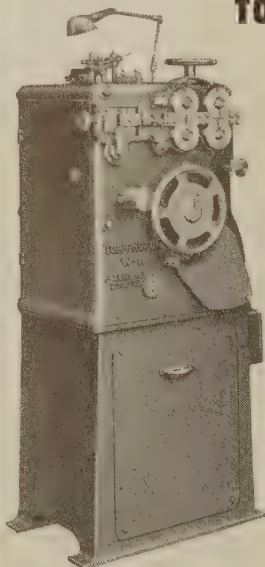


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Torrington's W-11 Spring Coiler

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The tricky torsion spring (shown above) is typical of the exacting work you can turn out with a Torrington Spring Coiler. For full details on this particular spring job or any spring making problem you may have, just drop a line to our Sales Department.

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Dravo Wins Contract To Build River Barge Unloading Terminal

Pittsburgh

••• Dravo Corp., here, has been awarded a contract to construct a river barge unloading terminal and other coal-handling facilities at the Frank R. Phillips Power Station of Duquesne Light Co. at Wireton, Pa.

Construction of the barge unloader, designed to handle 500 tons of coal an hour, will begin in June. It is expected to be completed by Dec. 1. Dravo now is building two additions to the power station that will more than triple its present generating capacity.

The coal unloader will be built on a concrete-capped sheet steel caisson, having a diameter of 38 ft 2 in., located adjacent to the west bank of the Ohio River about 20 miles northwest of Pittsburgh. Coal will be transported there by barge from mines along the Monongahela River above Pittsburgh.

The 22 ft high reinforced concrete base of the unloader structure resting on the pier will contain electrically-powered barge-shifting machinery, a 54 in. feeder conveyer and one end of a covered conveyer to the coal crushing plant, 253 ft away.

The unloading bucket is suspended from a trolley that runs on a structural steel boom extending out 57 ft from the unloading tower and 82 ft above the normal river level. The bucket, which weighs 7½ tons, is controlled by an operator in a cab on the tower and can lift 6½ tons of coal at a time.

Barges will be moved upstream and down under the trolley boom by cables extending north and south of the tower. These are controlled by the bucket operator and can shift a barge either way at a rate of about 30 fpm.

After the bucket scoops the coal from the barge, it will dump it into a concrete hopper in the base of the tower. Then a 48 in. conveyer belt takes it to the crusher plant. From there, the coal can be diverted to the storage pile or moved directly to the power station bunker.

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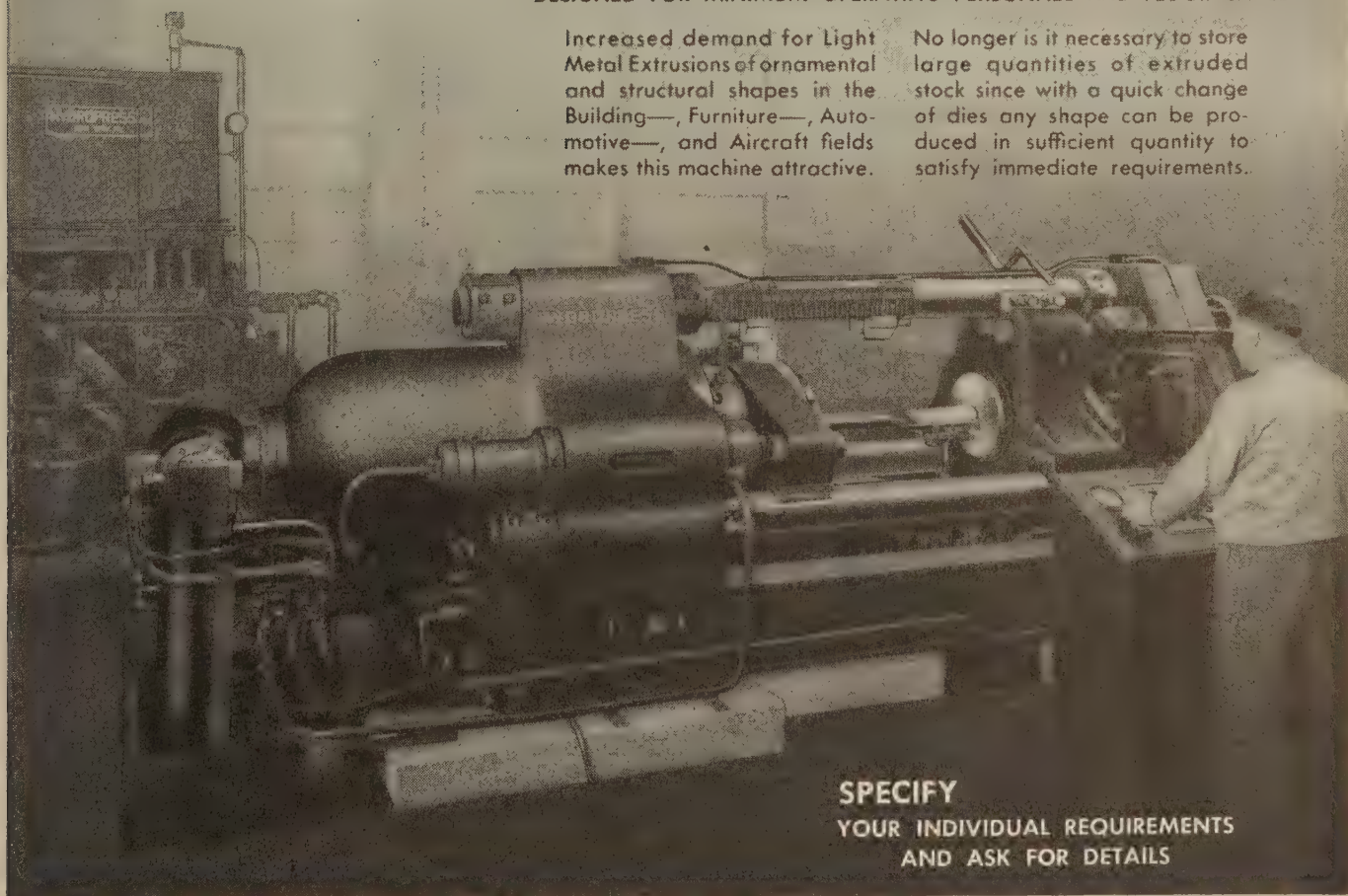
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Begins Operations At New Detinning Plant

Baltimore

• • • Full-scale operations began here recently at the Tin & Chemical Corp.'s new, million dollar detinning plant.

It has a capacity estimated at 30,000 tons of tinplate scrap annually by the alkaline detinning process. Its products will consist of high-grade pig tin and heavy melting scrap.

The plant was constructed by the Austin Co. according to plans designed by engineers of the Metal & Thermit Corp. which has an interest, together with Standard Metal Refining Co., in the new plant. Based on years of M & T experience, the plant is a model in automatic handling and processing.

The equipment includes baskets and tanks by Blaw-Knox, Ingersoll-Rand and Chicago Pneumatic compressors; Dorr Co. classifiers; Hannifin hydraulic presses; Logemann balers; Whiting & Robbins & Myers cranes; Sweetland filters; Bigelow boilers; Eastern Steel Tank and Buffalo Tank storage tanks, and pumps from Buffalo Pump Co.

Officers of the corporation are: Frank J. O'Brien, president; Walton S. Smith, vice-president; Hubert E. Rogers, secretary; John F. Condon, assistant secretary (all of New York); I. D. Shapiro, vice-president and general manager; Alexander Rogers, treasurer; and Alexander Papi, assistant treasurer (all of Baltimore).

Approves Export Linepipe

Washington

• • • Approval of licenses to the Trans-Arabian Pipe Line Co. for export of 47,500 tons of 30-31 inch welded linepipe during the second and third quarters of 1949 was announced recently by the Office of International Trade, Dept. of Commerce. This quantity is in addition to an earlier approval of 35,000 tons for the second quarter.

The entire Trans-Arabian Pipe Line, which is to run 1067 miles across the Arabian peninsula, is expected to require a total of 260,000 tons of linepipe, of which 161,500 tons has been licensed, OIT said.

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Here is a new booklet, just off the press, that belongs in the files of every man concerned with operating, maintaining, or purchasing pumping equipment.

Case histories drawn from important industrial fields, show how pump operators and manufacturers have successfully dealt with those long-time enemies of pump life—corrosion, fatigue, and excessive wear.

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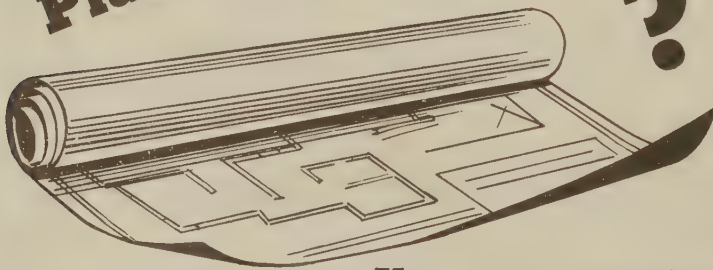
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Detroit, Michigan, New Center Bldg

Construction Rate Turns Up With May Building at \$1.6 Billion

Washington

••• Off to a slow start in 1949, the normal seasonal upturn has brought the construction rate back to a little better—about 3 pct—than a year ago.

With \$1.6 billion worth of new building put into place during May, the 5-month total stands at \$6.6 billion, the Office of Domestic Commerce reports.

The \$200 million increase over last year was brought about largely by increased expenditure in public works. Industrial (plant) building continues to decline while commercial (stores, business places) construction is slowing up. Farm construction is also off.

So far this year, expenditure of public funds for construction has passed the \$1.7 billion mark, broken down as follows (with all figures in millions and 1948 figures in parentheses):

Highways, \$438 (\$380); educational, \$324 (\$181); conservation and development, \$243 (\$173); water and sewer systems, \$216 (\$162); hospitals and institutions, \$159 (\$52); housing, \$55 (\$36); and all other, \$287 (\$250).

Forms Tin Research Group

Columbus, Ohio

••• Mr. John Ireland, director, Tin Research Institute, London, England, announces the formation of Tin Research Institute, Inc., an American corporation devoted to providing free technical service to consumers of tin in the United States. The office of the new corporation, located at 492 West Sixth Ave., Columbus 1, Ohio, will in the future, handle all inquiries or requests for technical service, while a sponsorship will be maintained at Battelle Memorial Institute to handle new researches.

Technical experts are available for consultation and practical assistance either at the Tin Research Institute or at the consumers' plants.

A wide range of publications covering every important use of tin is available free of all charges. Inquiries are invited.

Robert J. Nekervis has been ap-

Tough...flexible...decorative...

maybe it can give you ideas!



THE material you see above is braided wire. Here at National-Standard it is produced in almost limitless variations... flat, tubular, plain, beamed, springlike or untempered, tight or expanded, in many wire sizes, in a great many widths, and of any metal that can be drawn into wire.

At present, the most common uses are for reinforcing pneumatic tire beads, high pressure hose and other rubber products. In these applications its strength and mechanical adhesion qualities are unsurpassed.

Considering its limitless variations and unique qualities, braided wire is bound to have many other effective applications. Perhaps it can save or make money for you! An interesting possibility, for example, is its use with transparent plastics to produce pleasing patterns as well as reinforcement.

If all this gives you an idea you'd like to explore, be assured that National-Standard, as usual, is ready to cooperate with you all the way. Let's talk it over. Just get in touch with the *National-Standard Company, Niles, Michigan.*

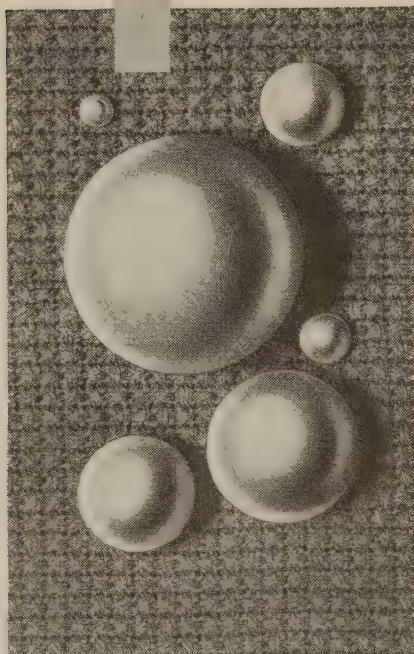


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WORCESTER WIRE WORKS.. Worcester, Mass.....	Round Steel Wire, Small Sizes

IN

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NEWS OF INDUSTRY

pointed supervisor of metallurgical development and Robert M. MacIntosh has been appointed supervisor of chemical development in the new corporation. Both have been associated with Battelle Memorial Institute for the last 8 years, and served as assistant supervisors in the nonferrous division handling problems related to tin.

Record Steel Production Reflects Technical Gains

New York

• • • Steel production, which attained a record of nearly 92,500,000 tons in the year ending May 31, has been benefiting from gains made by managers and technicians in their long struggle to solve raw materials problems and to improve the efficiency of plants and processes, says American Iron & Steel Institute in a summary of technical accomplishments.

The quality of coking coals has been improved through installation of washing plants, thereby improving the quality of coke for blast furnaces. Mechanized coal mining had increased this problem because it is less selective of coal than hand labor. Iron ore has been made more readily usable by increased beneficiation or concentration of its iron content. This is particularly important for lean ores. The quality of scrap has improved and some other raw materials are in better supply.

Much research work remains to be done on such problems but the fact stands out that in recent years the quality of steel has been maintained and improved in spite of less desirable quality of the basic raw materials for steel.

Output has been increased sharply through the benefits of larger furnaces, new and faster rolling mills, and improved facilities for charging furnaces so as to cut the time for this operation.

Sales and Net Increase

Chicago

• • • The estimated net income of the International Harvester Co. for the first 6 months of its 1949 fiscal year was \$37,479,000. This is an increase of \$8,960,000 over the net income for the same period of 1948.

*If you operate a Press Room
study these
Littell REELS*

HERE'S the way to speed up blanking, cupping, etc. Littell Reels enable you to use time-saving, money-saving coil stock in place of sheet stock. No more lost motion for continual insertion of new sheets. Less scrap, too. One operator using Littell Reels can tend several presses.

Littell Reels are self-centering. The heavy coil is always balanced for smooth, effortless feeding. They never over-run. Heads on No. 10 Reel and smaller are adjustable to any angle. Quick loading.

The Reels pictured are only three among dozens of Littell models. Write today for full details on Littell Reels, Feeds, Air-Blast Valves, Scrap Winders, etc. REQUEST BULLETINS.

Top—No. 3 Reel, 300 lbs. capacity. Center—No. 25 Reel, 2500 lbs. capacity. Bottom—No. 60 Reel, 6000 lbs. capacity.

F.J. LITTELL MACHINE CO.
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WHY

ARE ZINC DIE CASTINGS THE MOST WIDELY USED?

The die casting process offers the least expensive method of making a very large variety of complex metal parts. Alloys based on several different metals are employed for die castings, but zinc has for many years been the most widely used. The answer is simple—the *zinc alloys provide the greatest number of desirable mechanical properties and casting characteristics at the lowest cost.* Future advertisements will discuss these advantages individually, to give you a better understanding of just what zinc die castings can do for you.

THE ANSWER IS HERE

SELECTION FACTORS		ZINC ALLOYS	ALUMINUM ALLOYS	MAGNESIUM ALLOYS
MECHANICAL PROPERTIES	Tensile Strength	1 (strongest)	2	3
	Impact Strength	1 (toughest)	2	2
	Elongation	1 (most ductile)	2	2
	Dimensional Stability	2	1 (most stable)	1
	Resistance to Cold Flow	2	2	2
PHYSICAL CONSTANTS	Brinell Hardness	1 (hardest)	1 (highest)	3
	Electrical Conductivity	2	1 (highest)	2
	Thermal Conductivity	2	2	3
	Melting Point ¹	1 (lowest)	2	1 (lightest)
	Weight, per cu. in.	3	2	2
CASTING CHARACTERISTICS	Ease, Speed of Casting	1 (easiest)	2	2
	Maximum Feasible Size	1 (greatest)	2	3
	Complexity of Shape	1 (most complex)	2	3
	Dimensional Accuracy	1 (most accurate)	2	2
	Minimum Section Thickness	1 (thinnest)	2	2
COST	Surface Smoothness	1 (smoothest)	2	2
	Die Cost ²	1 (lowest)	2	3
	Production Cost ³	1 (lowest)	2	2
	Machining Cost ⁴	1 (lowest)	2	2
	Finishing Cost ⁵	1 (lowest)	2	2
EXTENT OF USE		1 (most used)	2	3

¹ A low melting point is favorable in reducing die cost and upkeep and facilitates casting.
² Dies for casting the low melting point alloys are least expensive and have longest life.
³ Includes polishing and buffing expense as well as ease of applying all types of commercial finishes, both electrodeposited and organic.
⁴ Based on die and tool costs, production speed and machining and finishing costs.

ZINC

NEXT
WIDEST USED
METAL

TONNAGE OF DIE CASTINGS
CONSUMED IN 1948

This comparison of the 1948 tonnage of zinc die castings and die castings of the next most widely used alloy are taken from a report prepared by the Bureau of the Census, Industry Division, Primary Nonferrous Metals Unit.



ZINC
FOR DIE CASTING ALLOYS

Ask your die casting source for our booklets covering all phases of the die casting process—properties, design, machining, finishing—or write directly to us.

THE NEW JERSEY ZINC COMPANY, 160 Front St., New York 7, N. Y.

The Research was done, the Alloys were developed, and most Die Castings are based on
HORSE HEAD SPECIAL (99.99 + %) ZINC
 (Uniform Quality)

let these SPECIALIZED WYANDOTTE COMPOUNDS

help solve your
metal cleaning problems

In the complete line of Wyandotte Metal Cleaners you'll find a product designed to meet your particular needs.

Wyandotte Porenac, for example, is prepared especially for the removal of drawing lubricants prior to porcelain enameling, barrel plating or oxide finishing. Its concentration requirements are low—its life in solution extremely long. Porenac sharply reduces cleaning time because it eliminates the necessity for pre-cleaning. It emulsifies the toughest mineral oil compound quickly and at low cost.

Wyandotte W.L.G.* is excellent for cleaning parts in rotary washing machines between machining operations and before inspection, assembly and heat treating. It is also an efficient soak-tank cleaner. In the electro-cleaning of steels, W.L.G. can be used as pre-soak cleaner where a double cleaning cycle is available.

Wyandotte Chemicals Corporation, with its own sources of raw materials, makes the complete line of *specialized* metal cleaners. Whatever your cleaning needs may be, it will pay you to get in touch with your nearest Wyandotte Representative.



*Registered trade-mark

WYANDOTTE CHEMICALS CORPORATION
WYANDOTTE, MICHIGAN • SERVICE REPRESENTATIVES IN 88 CITIES

Iron, Steel Imports Drop in March But Scrap Up 35,000 Tons

Washington

••• Imports of iron and steel declined to 64,000 net tons in March, but a corresponding rise in scrap imports of 35,000 tons helped to maintain a steady overall figure for total import tonnage during the month.

The Commerce Dept. and American Iron & Steel Institute, in reporting these figures, placed total iron and steel imports for the first 3 months of 1949 at 254,845 net tons, and total scrap imports for the same period at 593,706 net tons.

Net tonnages of iron and steel imports as compiled by the Institute from Commerce Dept. figures are as follows:

Products	March 1949	First Quarter 1949
Steel ingots, blooms, etc. . .	4,993	16,604
Wire rods	636	1,464
Iron bars and slabs	—	136
Concrete reinforcement bars	66	2,406
Hollow bar and drill steel..	2	5
Other steel bars	5,710	14,418
Boiler and other plate	4,999	10,111
Sheets, skelp, sawplates, n.e.s.	128	2,553
Tin plate, tagger's tin and terneplate	3	4
Other hoops and bands	2,494	4,652
Structural shapes and sheet piling	23,055	93,979
Rails and fastenings	335	627
Wheels and axles	18	18
Pipe and tubes	1,141	2,157
Round wire	1	8
Barbed wire	—	—
Flat wire and strip	140	390
Telegraph and telephone wire	50	83
Wire rope and strand	87	187
Wire fencing	—	—
Nails, tacks and staples	418	626
Bolts, nuts and rivets	9	28
Castings and forgings	12	33
Die blocks and blanks	156	637
Total	44,453	151,126
Other Finished Products:		
Cast iron pipe and fittings	3	102
Malleable iron pipe fittings	1	2
Enameled or glazed ware and utensils	—	—
Power transmission and other chains	23	42
Total	27	146
Pig iron	9,653	68,867
Sponge iron	181	862
Ferromanganese (mangan- ese content)	8,122	28,111
Spiegeleisen	—	—
Ferrosilicon (silicon con- tent)	87	268
Ferrochrome (chromium content)	195	867
Other alloys used in steel manufacturing	1,489	4,598
Total	19,727	103,573
Grand total	64,207	254,845
Iron and steel scrap	233,225	593,706

Proposes Storage Of Liquid Natural Gas For Winter Demand

Washington

••• A proposal to store natural gas in liquid form during the warm weather months for use in the Chicago area during periods of peak winter demand has been received by the Federal Power Commission.

The plan was outlined by Chicago District Pipeline Co. in an application for FPC authorization to construct and operate a \$6,000,000 plant in Chicago for the liquefaction, storage and regasification of natural gas.

The plant, which would have a storage capacity of 400,000,000 cu ft of gas, would have facilities for liquefying approximately 4,000,000 cu ft of gas daily and for regasification and return to the transmission system of 6,000,000 cfh, the company said.

The liquefaction process described in the application involves separation and recovery of butane and propane, removal of nitrogen, and storage of the gas in liquid form at a temperature below boiling point.

The company proposes to offer the storage facilities to its customer companies under a rate schedule based on the cost of service. Construction of the plant would be financed through a loan from Chicago District's parent company, Peoples Gas Light & Coke Co.

Opens Seminar Enrollment

Washington

••• The Institute of Scrap Iron & Steel, Inc., has formally opened enrollment for the scrap seminar which it is sponsoring at Northwestern University, Chicago, the week beginning Aug. 28. Only active members and employees of active members of the institute are eligible for enrollment.

The scrap seminar, which is to be conducted at Northwestern University's Chicago or downtown campus, is designed to provide an intensive course of instruction for junior executives in the fundamentals of the industry. Lecturers for the course will be drawn from experienced and qualified men in the ranks of the industry, steel mills and foundries, and the staff of Northwestern University.



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Light Gauge Stainless Steel Sheet Cost Reduced Up To 26%

Now you pay less for those super-accurate MicroRold Stainless Steel Sheets in gauges from 27 to 36. Effective May 23, the Washington Steel Corporation made substantial reductions on all extras in sheets of those gauges. The result is a saving to steel purchasers ranging from 11 to 26 per cent.

Washington Steel is able to make these price cuts because of the efficiency and economy of its cold rolling operations on the famous Sendzimir Mill. You continue to get the remarkable uniformity of gauge, the superior surface excellence, but you pay less for it.

REMEMBER



THE LAST DAY TO ENTER MicroRold's \$500 CONTEST



All entries in the \$500 contest for new uses and applications of MicroRold stainless steel in gauges .015 and thinner must be mailed before midnight, June 30. There is no limit on the number of entries a contestant may submit, so keep the ideas coming.

Entries will be judged on the basis of economic practicability and originality by a board of three judges: Dr. V. N. Krivobok, International Nickel Co.; Richard E. Paret, American Iron & Steel Institute; and John M. Campbell, Campbell Stainless Products Co. The decision of the board will be final.

All entries must be submitted on company letterhead.

WASHINGTON STEEL CORPORATION

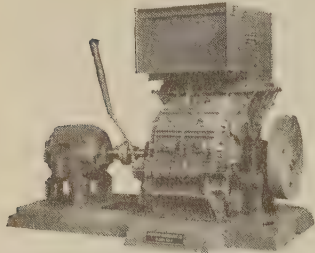
WASHINGTON, PENNSYLVANIA



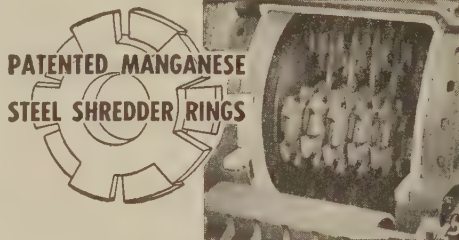
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The rapid reduction of long, curly, hard-to-handle turnings into short shoveling chips with Americans solves handling and storage problems. The low cost at which Americans operate makes their installation highly profitable. The yield of cutting oil is increased 30 to 50 gallons per ton. Alloy steel, carbon steel, aluminum, brass, and bronze turnings are reduced to uniform chips by Americans in capacities from 1 to 10 TPH.

Only Americans have shredder ring action that assures uniform chips and prevents clogging and stalling.



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IF ANYONE CAN STANDARDIZE on your needs for steel storage tanks or pressure vessels—regardless of their nature—Sharpsville can do it. Sharpsville originated the industry's present basic procedure—the multiple-ring method. When you state your needs, chances are Sharpsville has a "package" in stock that comes mighty close to exactly what is called for. If alterations or additions are necessary, Sharpsville has the personnel and facilities for accomplishing these operations in low-cost, jig time too. Invariably, you've got yourself a proud piece of tankage equipment that has cost Sharpsville—AND YOU—less in designing, engineering, production and erection.

Tanks from 275 to 30,000 gallons capacity furnished promptly. Underwriters' approved and labeled. Foundation plans, drawings and gauge tables provided without charge. ASME Code Pressure Vessels. Write today for illustrated literature, details.

Economy Through
Standardization

SHARPSVILLE Steel FABRICATORS

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Incorporated 1907

INCORPORATED DEPT. A
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Also fabricators and erectors of Field Storage Tanks, Stockpiles, Bins, Large Diameter Pipe and Miscellaneous Steel Plate Work

Issues Procedures For Renegotiation Excessive Profits

Washington

• • • Courses to be followed where a contractor and a military renegotiation board fail to reach an agreement on recapture of excessive profits, are given in the new Part 426 of the Military Renegotiation Regulations which has been issued by the Military Renegotiation Policy and Review Board.

When the contractor and service board do not reach an agreement as to excessive profits to be recaptured, the board may set the amount and the method of eliminating them.

This order will become final within 60 days unless it is brought up for review. It may be reviewed by the full Military Renegotiation Policy and Review Board either on its own motion, or at the contractor's request.

The determination made as a result of this review may be appealed to the Tax Court of the United States within 90 days after the mailing of notice of the decision to the contractor.

The new Part 426 has been published in the Federal Register of June 3, obtainable from the Government Printing Office, Superintendent of Documents, Washington 25, D. C.

Permanente Metals Corp. Buys Aluminum Rod Mill

Washington

• • • Permanente Metals Corp. of Oakland has purchased a surplus aluminum rod and bar mill at Newark, Ohio, at a sale price of \$4.5 million. It has been under lease to Permanente and production is expected to start within the next month.

The plant was constructed by the government during the war for the production of 10 million lb of aluminum blooms and 15 million lb of rod per month. It has a casting capacity of 40 million lb per month, which is in excess of rolling capacity.

Permanente has informed WAA that it proposes to use the facilities to produce smaller size rods and bars and has installed a wire and cable mill costing approximately \$4 million.

Production Starts On "Skyhook" Type Of Mine Roof Support

Pittsburgh

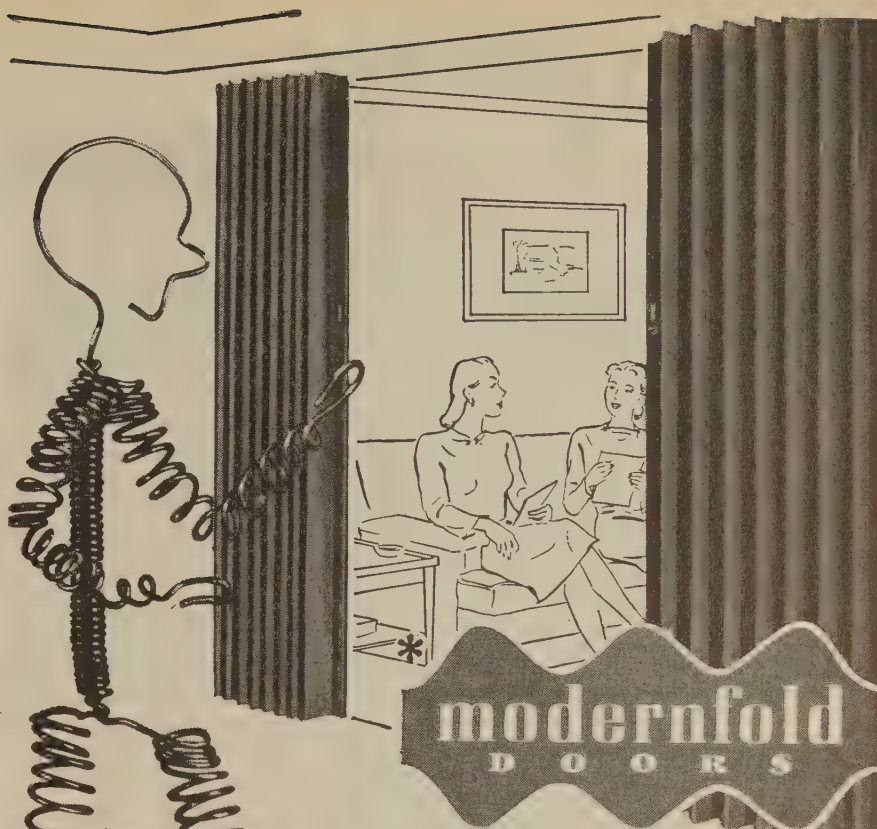
• • • Oliver Iron & Steel Corp. is now in commercial production on two bolt-type mine roof supports, popularly called "skyhooks." The technique, which has been used for some years in metal mines, has recently been tested by the U. S. Bureau of Mines and is reported to reduce the danger of cave-ins.

The name derives from the way the bolts support the roof from above rather than from below, as posts do. The theory of the bolt's effectiveness as a mine roof support is that the long shaft of the bolt penetrates several layers of roof strata and combines the strength of the thinner layers so that they act as one heavy layer. This is done by bolting washers to the bottoms of bolts anchored in the roof. To provide even more than this "plywood" action in tying slate or rock layers together, bolts can be attached to each other with steel channels.

Although St. Joseph Lead Co. has used the roof type support for some 20 years it was only recently that the Bureau of Mines began investigating its possibilities for use in coal mines too. Two years of tests in 50 miles of passageways were run by the bureau, without a single lost time accident caused by a roof fall. As timbers squeak to warn of an impending cave-in, the bolts begin to sing like a musical saw as much as 48 hr before the roof falls in.

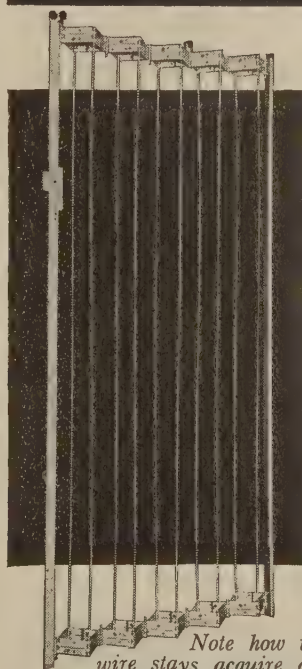
Perhaps the most widely accepted type of bolt is one an inch in diameter and 3 ft or more in length. Its top end has a longitudinal slot $\frac{1}{8}$ in. wide centered on its diameter and extending down about 6 in. into the bolt. A 6-in. long steel wedge tapered from $\frac{1}{8}$ to $\frac{3}{4}$ in. comes with the bolt. The lower end of the bolt is threaded for about 4 in.

It takes about 3 min, on the average, to set the bolt in place, as follows: A hole is drilled a little shallower than the length of the bolt to allow the thread to stick out on the bottom. The steel wedge is then started in the bolt slot and the two are pushed up into the hole. When the wedge hits



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made with
KEYSTONE WIRE



Note how the Keystone wire stays acquire an accordion-like action from the precision-built hinge-plate.

* New Castle Products

New Castle, Ind.

Modernfold Doors are a revolutionary type of folding wall . . . with a smooth, trouble-free, accordion-like operation.

A framework of vertical stays made of Keystone galvanized wire forms a firm foundation to which colorful fabrics are attached. The wire stays give added strength and rigidity to the accordion-like construction and play an important part in the patented hinge-action at top and bottom.

Modernfold Doors are the work of master craftsmen. All materials used in their construction are rigidly tested . . . with special emphasis on quality. That's why rust-resisting Keystone galvanized wire is specified.

Keystone wire is a recognized factor in the unique and practical construction of these modern closures.

SPECIAL ANALYSIS WIRE
for all industrial purposes

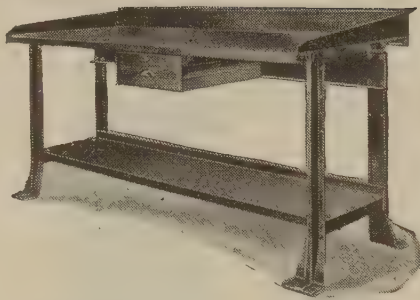


KEYSTONE STEEL & WIRE COMPANY
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MONEY-SAVERS

Fig. 732
Pat'd Pats. Pend.
Drawer is extra.

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WORK BENCHES OF STEEL

These serviceable ready-made "HALLOWELL" Work Benches of Steel are made in standard heights, widths and lengths with long-wearing steel tops . . . high grade, laminated wood tops . . . or, steel tops covered with "Tempered Presdwood." Because the "HALLOWELL" is made of sturdy steel, it is rigid as a rock and does not require costly bolting to the floor. Being *standardized*, the single "HALLOWELL" Benches around your shop may be bolted together to form one long bench—that's a money-saving feature not practicable with "nailed-together" wooden benches.

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Continuing research, backed by almost a century and a half of experience, enables H-VW-M to consistently open up new and better ways of meeting the requirements of the electroplating and polishing industry . . . to develop new products and new methods that serve the industry better.

H-VW-M may be the key you're looking for to solve puzzling pickling, polishing, buffing, cleaning, anodizing or plating problems, or to provide new ideas to help you serve your customers better.

Visit Hanson-Van Winkle-Munning headquarters, Hotel Schroeder at the A.E.S. Convention, Milwaukee, Wisconsin, June 27th through 30th, 1949.

H-VW-M's new laboratory at Matawan, N. J., provides the ultimate in facilities for research and development in the electroplating and polishing field.



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MATAWAN, NEW JERSEY

Manufacturers of

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NEWS OF INDUSTRY

the top of the hole the bolt is driven on in, forcing the wedge to expand the bolt and anchor it in the hole. A large washer or a steel channel is then fastened to the bottom of the bolt.

Those interested in selling the skyhook claim that it will not only mean greater safety but permit as much as 15 pct more air to be pumped to the working faces—both by elimination of posts. In 1946, they point out, 14 fatal accidents and 138 nonfatal accidents were caused by roof falls in coal mines when supporting posts were accidentally dislodged. In that same year there were 1700 accidents when moving equipment squeezed men against posts or roof timbers.

Cost comparisons between timbering and skyhooking are not conclusive yet, the boltmakers say. Oliver also makes a bolt fitted with a soft metal sleeve that expands to anchor the bolt in place.

Western Society Elects

Chicago

• • • Gustav Egloff, director of research for the Universal Oil Products Co., Chicago, was elected president of the Western Society of Engineers at its annual election.

Other officers elected were H. P. Sedwick, Public Service Co. of Northern Illinois, first vice-president; J. C. Witt, consulting engineer, second vice-president; and Donald N. Becker, A. J. Boynton & Co., treasurer. Ludwig Skog, Sargent & Lundy, and L. F. Bernhard, Illinois Bell Telephone Co., were elected trustees for 3 years. The new officers were recently installed at the society's annual dinner.

Opens Fabricating Plant

Birmingham

• • • The new fabricating plant here of Virginia Bridge Co. was opened recently with a plant inspection by the company's customers and business associates.

The new plant contains about 8 acres under roof. The building is of steel, brick and concrete construction, with corrugated galvanized steel roofing and siding. Floors are of concrete.

Virginia Bridge employs a force of approximately 650 persons at the Birmingham plant.



5307

Government Controls Eased for Use of Tin In Can Manufacture

Washington

• • • Government controls over the use of tin were eased by the Commerce Dept. on June 3. The changes were put into effect by amending Allocation Orders M-43 and M-81.

However, the federal government's stockpiling program is not affected by the new relaxation of the controls, the department stated.

Order M-81, which sets specifications for tinsplate used in the manufacture of cans, now permits use of 0.25 lb tinsplate or special coated manufacturing terneplate for packaging any product. The revised order also permits use of 0.50 lb tinsplate in the production of (1) all hand-soldered cans, (2) drawn necks and nozzles, (3) soldered parts of all 5-gal sq cans.

Also, the broader use of 0.25 lb tinsplate now permitted is of particular benefit to small can manufacturers engaged—for the most part—in production of general line (nonfood) cans to a greater extent than are the larger companies, the department said.

Smaller producers have experienced heavy losses from rusting in their efforts to use blackplate. The change will benefit packers previously limited to blackplate cans, it was pointed out.

Use of 0.50 lb tinsplate in the items listed also will help the small manufacturer who does much hand soldering, and will serve to speed up production on even the most modern machinery.

Another change in M-81 permits the Army and Navy and the Dept. of Agriculture to purchase and use cans of any specifications for their food products, many of which are shipped to areas where climatic conditions are hard on tinsplate and storage facilities inadequate.

Changes in Allocation Order M-43, the basic tin control order, provide for free use of 0.25 lb electrolytic tinsplate and 1.30 lb special coated manufacturers ternes; relatively free use of excessive accumulations of low-grade tin-bearing secondaries; wider use of pig and secondary tin in collapsible

Smooth Action and Ruggedness that PAY DIVIDENDS in Any Doorway



KINNEAR STEEL ROLLING DOORS

Above installation shows how hood of Kinnear Rolling Door can be mounted on building exterior where desired. May also be concealed above lintel or mounted on inside wall.

You save in at least three ways when you equip service openings with Kinnear Steel Rolling Doors. First, their smooth, easy, coiling upward action gives you full use of all surrounding floor and wall space. Materials of any kind can be stored within an inch or two of the doors, inside or out, without impeding their operation. They open completely out of the way of traffic, coiling compactly out of wind's reach.

Second, Kinnear's neat, strong curtain of interlocking steel slats assures

long, dependable, low-maintenance service. Upkeep costs are negligible.

Third, the all-metal construction of Kinnear Rolling Doors gives you extra protection against fire, intruders, wind and storm damage, and other hazards.

Years of actual use in hundreds of buildings prove the economy and high efficiency of Kinnear Rolling Doors. Motor or manual control. Easily installed in old or new buildings. Any size. Write for details today!

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**SAVING WAYS
IN DOORWAYS**

**KINNEAR
ROLLING DOORS**

- ▶ **Quality controlled products**
- ▶ **Increased production**
- ▶ **Reduced fuel costs**

... Features of F. E. I.'s Patented Combustion System

The F. E. I. patented combustion system provides uniform top and bottom temperatures by causing a double pass of the products of combustion around the inner covers before leaving the furnace, consequently eliminating the possibility of localized overheating. The F. E. I. system is completely automatic, providing maximum fuel burning capacity for high production demands, but at the same time permitting high turn down ratios for extended soaking periods.

The F. E. I. combustion system utilizes with equal efficiency the following types of gas: natural, coke oven, butane, oil refinery, clean producer and clean blast furnace.

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*Through the Contract
Manufacturing Section
for the Plant
with the Facilities
to do your Work.*

NEWS OF INDUSTRY

tubes; increases in use of tinned wire, electric tin tubings and fittings, and further relaxation in use of chemicals derived from low-grade secondary sources.

Tin content in solders for general use is increased. The tin content limit in copper base alloys for use in memorials is raised to 6 pct, from 3.5 pct, and for general use to 10 pct from 6 pct. This last specification revision was made to relieve manufacturers of accumulations of secondary copper base alloys containing tin.

BM Report Describes Methods Used in Mine Reopening, Developing

Washington

• • • **Methods** used in reopening and developing a small Alabama red-iron-ore mine that had been idle since shortly after World War I are described in considerable detail in a report released by the Bureau of Mines.

The operation is the Gadsden Mine of the Etowah Coal & Iron Co., situated on the southwest end of the Shinbone Ridge in the outskirts of the city of Gadsden.

The work of unwatering, rehabilitation and development began in 1946, and about 1500 tons of ore had been produced at the time the study by the Bureau of Mines was completed in 1947. Besides a history of the operation—sometimes referred to locally as the Hammond Mine after a former owner, and sometimes as the Jap Mine because during World War I it was operated by a Japanese company—the report discusses the geology of the area and the physical characteristics of the ore and its enclosing rocks.

The surface plant is described in detail, as is also the mining equipment used underground. Costs of rehabilitating and developing the mine are given so far as they can be determined definitely, and estimated with regard to items that cannot be isolated from other expenses of the company.

The report is one of a series that the Bureau Mining Div. is preparing for the benefit of the general mining industry. Its objective is stated as to describe "the means whereby engineers have solved local problems in reopening an abandoned mine at which equipment, facilities, and funds were limited."

(CONTINUED FROM PAGE 128)

the position of the Bizone in European trade is further complicated by the phenomenal shrinkage in trade between eastern and western Europe. Germany is of all European countries the one most affected by the loss of eastern markets. Its long-term plan requires a complete restoration of the prewar position, but this would entail an eightfold increase in a volume of trade which at present does not exceed \$60 million each way.

YET unless such expansion can be secured, the loss of eastern Europe as a market will only aggravate the increasing lack of natural balance in western European trade. This disequilibrium takes two forms. The first is the highly competitive structure of western European production and trade. All the western European countries need much the same imports of food and raw materials. All export much the same type of manufactures. If German industry is cut away from its old eastern markets, this competitiveness will be greatly increased. As it is, British exports overseas have only increased by the percentage of Germany's loss.

The second aspect of the lack of balance has only become apparent with the publication of the Marshall countries' long-term plans. It is clear from these plans that western European planning is based, unconsciously perhaps, but decisively, on the ideal of national autarchy. In each plan, emphasis is placed on the same phases of heavy industrial development. Each plan does away with some aspect of European industrial specialization. For instance, Benelux and Switzerland are expanding textile production, Sweden is introducing watchmaking, and in dyestuffs, steel, machine tools and cotton goods the countries which manufactured the least of these products before the war are now planning the biggest increases. Another aspect of the same policy is the tendency to expand industries which produce substitutes for imports, but since these replaceable imports are mainly European in origin, the process must lead to a decline in intra-European trade.

The truth is that western Europe is involved in the worst form of planning. Liberalism at least allows the nations to benefit by an international division of labor. Genuine international planning



We continually endeavor to anticipate the needs of our customers. Consult us about your tube requirements early.

**Boiler Tubes — All Types
Expanders & Fittings**

**Stay Tubes — Marine
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to A.A.R. Specs.**

Pipe Size Pressure Tubing

**Mechanical Tubing
Seamless & Welded**

**Stainless Steel Tubing
Standard & Extra Heavy**

Special Analysis Tubing

We are equipped to fabricate tubes to your specifications in our own shops.

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AMS 6260

AMS 6270

AMS 6272

AMS 6280

AN-S-14A

AMS 6324

AMS 6415

AN-QQ-756A

AMS 6320 (Hex)

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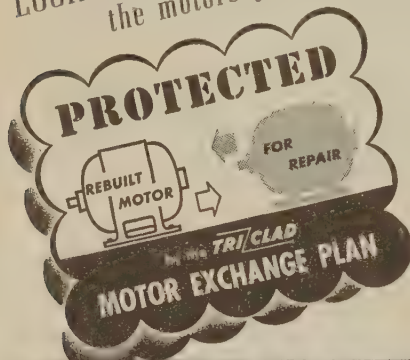
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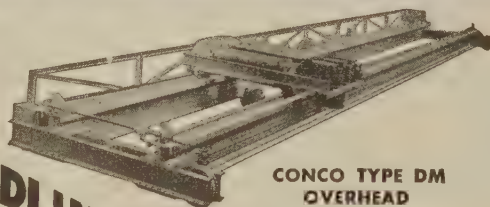
General Electric is happy to announce that the motor exchange plan which proved so successful with fractional-hp motors has been extended to cover integral-hp Tri-Clad motors. 16 Motor Exchange Centers are prepared to make an immediate exchange of Tri-Clad open (dripproof) motors (popular types, 4-pole, 1 to 5 hp) during the first five years of service. How the new plan works to reduce machine down time and motor replacement costs is told in Bulletin GEA-5189 (for motor users) and Bulletin GEA-5180 (for machinery manufacturers). SEND FOR YOUR FREE COPY to Apparatus Department, General Electric Company, Schenectady 5, N. Y.

756-2

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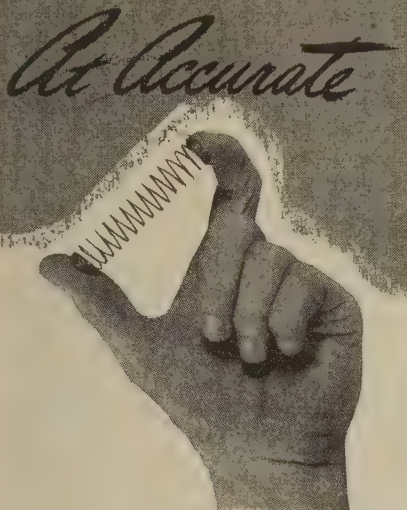
◆ EUROPEAN LETTER ◆

would allot to each nation the tasks most suitable to it. But purely national planning inevitably aims at autarchy because autarchy can be controlled and free multilateral trade cannot. Under its present plans, Europe will emerge from the Marshall era less economically unified than it went in.

What can be done about these multifarious obstacles to expanding trade? It cannot be repeated too often that the problem of the dollar gap is now essentially an American problem. One of the great values of the ECE survey of 1948 is that it states this fact in a plain, unvarnished way. The European deficit is simply the obverse of the American surplus and of the three ways of meeting the gap—by expanding European exports, by curtailing imports from America or by continuing to borrow—the European nations can within their own powers choose one course only, the one they have already chosen, the most unprogressive and restrictive course, that of cutting imports. An expansive solution, one which would increase the world's wealth and make possible the expansion of free multilateral trade, can be made effective only by the United States. If it expands its purchases or lends consistently, the major disequilibrium in world trade will vanish. Otherwise, it will not.

But if the major problem is beyond their grasp, the Marshall countries can make a vigorous attack upon the obstacles which prevent a limited equilibrium in the non-dollar world. A joint program of action to remove the underlying hindrances to trade would do far more for Europe than plans for making currencies convertible or transferable which seek to leap over the obstacles by purely monetary devices. Such a program would aim in the first place at the development of markets complementary to the industrial Marshall group. The development of French agriculture and further investment in the overseas dependencies would be a part of the program, but the speediest method would probably still lie in taking up with real purpose the problem of trade with eastern Europe. At present the plans of the eastern European countries point away from the expansion of agriculture, but their need for industrial equipment from the west is such that they might be persuaded

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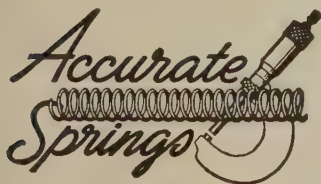


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EUROPEAN LETTER

to produce food surpluses for guaranteed markets.

A second point in the program could pursue the extension of convertibility by concentrating on a factor in European trade that has tended towards genuine multilateral trading in the last year. The fact that Britain has had an export surplus with western Europe and an import surplus with eastern Europe has made possible an extension of multilateralism on the basis of sterling. The process has also been encouraged by the inclusion of Czechoslovakia, the Dutch and Spanish monetary areas, Finland, Italy, Norway, Poland, Sweden and Russia in the system of transferable sterling accounts. Thus over part of the world, sterling has become to a limited extent an international currency.

THIS hopeful development should encourage the British to consider some extensions in the practice of transferability, for instance, the transferability of drawing rights under Marshall aid.

A final and most important point would lie in reversing the present disastrous trend of European planning. A return to complete liberalism is out of the question, since no European economy is ready to leave itself completely at the mercy of external and automatic forces. But it might be possible to reverse the trend of autarchic nationalism by moving in two directions simultaneously. In certain key industries where overexpansion is already certain, in steel, textiles, oil refining and artificial fertilizers, and possibly in certain other sectors such as mining, electricity and transport, OEEC should press on with the task of producing genuine coordination of capital investment. In other fields of production the way back towards competitive flexibility may be found, as the British government has proposed, not through fancy monetary schemes which do not correspond to reality, but by the simpler and more obvious device of enlarging import quotas and liberalizing the grant of import licenses. Unless some such change of method is adopted, western Europe will continue to hammer itself into its own autarchic straitjacket and by 1950 it may find that it has deprived itself of all power of movement, even of the power to breathe.

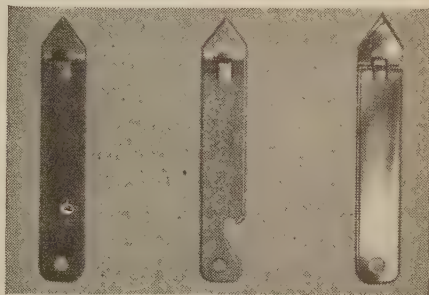
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Inquiries Up In Machine Tool Industry But General Trend Down

• • • A continuing increase in the volume of inquiries was the only change evident in the machine tool market pattern this week despite supercharged sales efforts by major segments of the industry.

Trade reports indicate May order volume, shipments and backlog will be down less than 10 pct from April. Foreign orders, down in some cases as much as 40 pct, figure to be the reason for the drop. Domestic business is holding up, and the new firm order net will be less than 10 pct off April, according to trade reports. This would bring the machine tool industry close to the low point of 1947, which was August and September.

As a parallel, the contract tool and die business is limping, but not as badly as some observers surmise. Sales invoiced during April, latest month available for comparison, were 89 pct of April, 1948. However, orders, backlog and employment are down. A lot of work is being figured which contract tool and die manufacturers hope will come through in the late summer or early fall.

Price structure in the contract tool and die industry is sagging in spots, which is the direct result of the great expansion of the industry during the war and the fact that there is not enough work to go around to keep shops normally busy at this time.

In Rockford, Ill., sales executives of machine tool builders are hard to find at home these days. Most of them are out knocking on doors with the rest of their staff.

Builders in the Rockford area report every single company in the business is quoting on all lines and selling is rugged. New orders are extremely light on automatic screw machines, shapers, large grinders, milling machines, lathes and drilling machinery.

Transfer type machinery, however, is still moving along at a fair volume. Last week shipment of a transfer machine which will

Increased Sales Efforts Have Kept Domestic Business Up; Foreign Orders Down

• • •

completely machine water pump housing from the raw casting, was made to a large motor car company. After passing through this machine the bearing inserts are pressed in place and the pump cover is ready to go to assembly. Interest is still intent on such types of machinery and part of the second line of transfer machines for the Kettering engine block is about to be shipped from here.

Another manufacturer has recently completed its first order for a double housing, triple head, duplicating planer. Recently fair sized orders for duplicating planers for jet wing sections have also been received.

Companies here have received fair orders on the ECA program so far this year. Some of them report South American and Mexican business doesn't exist; others declare they are receiving small orders occasionally from that area.

Over all, officials of the machine tool plants here are not moaning as loud as in some other midwest areas. These men are concerned over the slump but they believe business will pick up eventually. They report that their customers need and want all kinds of machinery. Further, the money is available to buy it and what the builders have to do is convince management to loosen the purse strings. This isn't easy but the salesmen are out trying. Some machine builders believe the customers will eventually buy, pressure or no pressure, and when they do it will be a general condition at which time the industry can expect an upturn. When asked

when this might happen, they invariably shrug and counter, "What's your guess?"

In Cleveland, the strike at Warner & Swasey Co. entered its 122nd day. At press time, Charles J. Stillwell, company president, told THE IRON AGE that as a result of an overwhelming number of favorable responses from strikers, members of International Assn. of Machinists, who were asked in letters sent out by the company last week to reply if they wanted to return to work on the basis of the company's last proposal, "We will have to reopen the plant.

"When we are going to reopen the plant I don't know, but a lot of people want to come back to work," he added. "It would be unfair to these employees if the company did not reopen.

"There will be no more meetings or negotiations—we want our people to come back."

In his letter to striking employees, Mr. Stilwell pointed out that "not everybody who walked out in December can come back to work. Some jobs have been taken out of our shop entirely—much tool room work which we had last year has been canceled.

"We still have in the office a fine list of orders waiting to be filled. It doesn't seem to me, when you think about it seriously, that it is a good time to be out of work and for other shops to be getting work which you might be doing here."

In Detroit, requests for machine tool quotations continue to come in, although orders are off noticeably compared with a year ago as far as most suppliers are concerned. The prospect for many firms in this area is admittedly that a poor third quarter will be added to a mediocre first half.

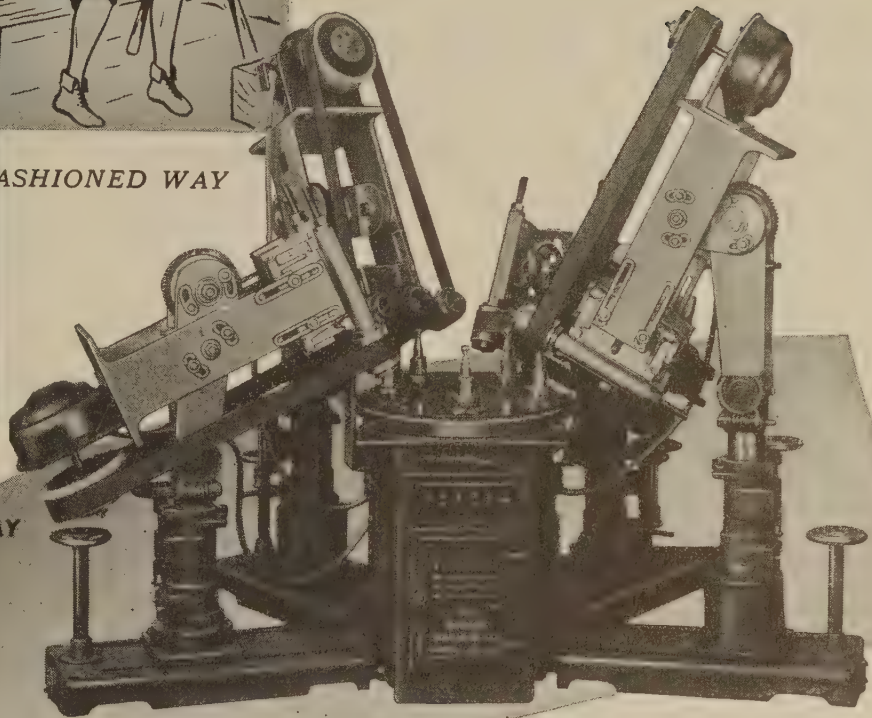
Quotations are still being furnished to Dodge for a new engine, but no actual placements have been reported. Some Borg-Warner orders for the new Studebaker transmission have recently been placed in Detroit.



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More Production Curtailments Seen As Prices Edge Downward

New York

••• The decline in metals prices was resumed again last week when copper was reduced by $\frac{5}{8}\phi$ and zinc by $\frac{3}{4}\phi$ on June 8. The following day there was another $\frac{1}{2}\phi$ reduction in the zinc market. On Monday of this week copper was reduced another $\frac{1}{2}\phi$. Price of electrolytic copper is now 16.50¢, Connecticut Valley, lowest since November 1946 when OPA controls lapsed. The present price of Prime Western zinc is 9.50¢ East St. Louis, 10.20¢ New York is also lower than at any time since the end of OPA.

The brass mills had also put into effect by June 10 further reductions in mill products prices to bring them into line with the last two copper reductions, three in zinc and one in lead. The reductions in copper products were 1¢ per lb and in brass and bronze alloys they were somewhat higher.

Refineries dropped their copper scrap buying prices at once to 12.00¢ for No. 1 copper and wire. Dealers buying prices for scrap metal were reduced by 1¢ on copper and brass grades, and 1¢ on zinc and aluminum grades. Nickel and Monel scrap buying prices were reduced by 1¢ and in some cases by 2¢ per lb. The only development contrary to the trend was in lead scrap where supplies are growing increasingly tight and smelters have reduced the smelting charge again. It is set now at \$60 a ton.

The apathy in the metal markets is overwhelming in all fields. But it is reported in many quarters that buying is going on in small lots, which indicates that a good many consumers must have reduced their inventories to the minimum.

Mining companies are continuing to reduce their operations. The Bunker Hill and Sullivan Mining and Concentrating Co. will reduce operations to a 5-day week. Consolidated Coppermines Corp. will suspend underground mining operations and reduce its openpit operations to a 5-day week. Anaconda

Copper Consumers Say Market Doldrums Not Caused By Tariff Suspension

o o o

Copper Co., Kennecott Copper Corp. and Phelps Dodge have previously released information on reduced mining operations.

If the present weak prices and light buying continue, more production curtailments can be expected. Each price reduction passes the break even point for some operations. But some observers expect a temporary shortage to develop when inventory corrections have been completed by consumers.

The controversy over the continuation of the suspension of the 2¢ per lb copper tariff was in the news again last week. Consumers are strongly voicing their opinion that a continuing need exists for the suspension. They point out that the present market situation is not the outgrowth of heavy imports, but reflects the inventory reduction program of domestic consumers. Two of the major producers of copper in this country also conduct operations in South America. In the past, the tariff has not proved effective in keeping copper out of this country, but served principally to keep the domestic market price of copper above the world price.

Consumers fear that if there is a revocation of the tariff suspension, there may be a renewal of the critical shortage if the market

should return again to normal, particularly in view of the intention to stockpile copper at the rate of 20,000 tons a month. There is also the possibility of a wave of strikes in mines and refineries as the result of the next round of wage negotiations. In addition there is also the latent possibility of a strike at the openpit operations at Bingham, Utah, which would seriously reduce domestic production again.

Assuming that the government's procurement rate over the next fiscal year will remain about the same as now, industry is in a position to meet stockpiling requirements for lead, zinc and bismuth without shortening shipments to private industry.

In its regular meeting last week, the Nonferrous Metals Industry Advisory Committee told the Munitions Board that with lead supplies more readily available, industry could probably ship as much as 200,000 tons a year for stockpiling if deliveries are scheduled for the summer months.

A consensus of committee opinion was that with both consumption and production down, about the same quantity of bismuth could be made available, and although there is increasing demand for galvanized sheet, lessened steel consumption would make zinc sufficiently available.

On the other hand, with no new antimony being mined and imports from Mexico sharply curtailed, in face of the impending shortage the munitions board indicated that stockpile supplies are adequate for some months to come.

Nonferrous Metals Prices

	June 8	June 9	June 10	June 11	June 13	June 14
Copper, electro, Conn.	17.00	17.00	17.00	17.00	16.50	16.50
Copper, Lake, Conn.	18.625	18.625	18.625	18.625	18.625	18.625
Tin, Grade A, New York	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03
Zinc, East St. Louis	10.00	9.50	9.50	9.50	9.50	9.50
Lead, St. Louis	11.85	11.85	11.85	11.85	11.85	11.85

Note: Quotations are going prices.

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	38.50
Beryllium copper, 3.75-4.25% Be	
dollars per lb contained Be	\$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	\$52.00
Bismuth, ton lots	\$2.00
Cadmium, del'd	\$2.00
Cobalt, 97-99% (per lb)	\$1.80 to \$1.87
Copper, electro, Conn. Valley	16.50
Copper, lake, Conn. Valley	18.625
Gold, U. S. Treas., dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$100 to \$110
Lead, St. Louis	11.85
Lead, New York	12.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask f.o.b. New York	\$82 to \$84
Nickel, electro, f.o.b. New York	42.93
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$69 to \$72
Silver, New York, cents per oz.	71.50
Tin, Grade A, New York	\$1.03
Zinc, East St. Louis	9.50
Zinc, New York	10.20
Zirconium copper, 10-12 pct Zr, per lb contained Zr	\$12.00

Remelted Metals

Brass Ingot

(Published prices, cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	13.75*
No. 120	13.25*
No. 123	12.75*
80-10-10 ingot	
No. 305	20.00
No. 315	17.00
88-10-2 ingot	
No. 210	26.50
No. 215	23.50
No. 245	16.50*
Yellow ingot	
No. 405	11.50*
Manganese bronze	
No. 421	18.00
* F.o.b. Philadelphia.	

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	19.00-19.50
0.60 copper, max.	18.50-19.00
Piston alloys (No. 122 type)	16.00-16.50
No. 12 alum. (No. 2 grade)	14.75-15.25
108 alloy	15.50-16.00
195 alloy	17.00-17.50
13 alloy	18.50-19.00
AXS-679	15.75-16.25
5% Ti, Aluminum, f.o.b.	
Low copper	31.00
2% copper	28.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-95½%	15.75-16.25
Grade 2—92-95%	14.75-15.25
Grade 3—90-92%	13.75-14.25
Grade 4—85-90%	12.75-13.25

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	34½
Electrodeposited	28½
Rolled, oval, straight, delivered	31.84
Ball anodes	32½
Brass, 80-20	
Cast, oval, 15 in. or longer	30½
Zinc, oval, 99.886, f.o.b. Detroit	22½
Ball anodes	20½
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	\$2.15
Silver 999 fine, rolled, 100 oz. lots, per troy oz, f.o.b. Bridgeport, Conn.	79

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	48.00
Copper sulfate, 99.5 crystals, bbl.	9.10
Nickel salts, single or double, 4-100 lb bags, frt. allowed	18.00
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz. lots, per oz.	59
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc sulfate, crystals, 22.5 pct, bags	6.75
Zinc sulfate, 25 pct, flakes, bbl.	7.75

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.3¢; 76S-O, 76S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 76S-O, 76S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 76S-O, 76S-OAL, 47.6¢.

Plate: ¼ in. and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 76S-F, 76S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 35.1¢ to 66¢; 11 to 13, 36.1¢ to 78¢; 23 to 25, 38.2¢ to \$1.07; 35 to 37, 45.7¢ to \$1.65; 47 to 49, 67.5¢ to \$2.41.

Rod, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3.5 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Drawn, ¼ to 1 1/32 in., 11S-T3, R317-T4, 49¢ to 38¢; cold-finished, ¾ to 1½ in., 11S-T3, 37.5¢ to 35.5¢; ¾ to 2 in., R317-T4, 37.5¢ to 34.5¢; rolled, 1 9/16 to 3 in., 11S-T3, 35.5¢ to 32.5¢; 2½ to 3¾ in., R317-T4, 33.5¢ to 32.5¢. Base 6000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.: 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 56S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed Base quantity 30,000 lb)

Sheet and Plate: Ma, FSA, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-1.01; 22, \$1.22-\$1.31; 24, \$1.62-\$1.75. Specification grade higher.

Extruded Round Rod: M, diam in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, \$1.14; 5/16 to ¾, \$1.02; ¾ to ¾, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, ¾ to 7/16, 85¢; ¾ to ¾, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, ¾ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks		40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	30.68		30.28
Copper, hot-rolled		26.53	
Copper, drawn		27.78	
Low brass	28.97	28.66	31.88*
Yellow brass	27.77	27.46	30.78*
Red brass	29.36	29.05	32.27*
Naval brass	32.76	26.82	28.07
Leaded brass		22.31	26.45
Commercial bronze	30.28	29.97	32.94*
Manganese bronze	36.27	30.17	31.67
Phosphor bronze, 5 pct	49.87	50.12	
Muntz metal	30.78	26.34	27.59
Everdur, Hercu-loy, Olym- pic, etc.	35.59	34.51	
Nickel silver, 10 pct	38.70	41.04	41.17
Architectural bronze			26.45

*Seamless tubing

Scrap Metals

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turn- ings
Copper	14½	13¾
Yellow brass	12	11¼
Red brass	13½	12¾
Commercial bronze	13¼	12
Manganese bronze	12	11¼
Leaded brass rod ends	11¾	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	12.00
No. 2 copper wire	11.00
Light copper	10.00
Refinery brass	9.75*
Radiators	6.50
*Dry copper content.	

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	12.00
No. 2 copper wire	11.00
Light copper	10.00
No. 1 composition	9.00
No. 1 comp. turnings	8.50
Rolled brass	7.00 to 7.25
Brass pipe	3.25
Radiators	7.25
Heavy yellow brass	7.00

Aluminum

Mixed old cast	7.50
Mixed old clips	7.50
Mixed turnings, dry	6.00
Pots and pans	7.50
Low copper	11.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	10	10½
No. 2 heavy copper and wire	9	9½
Light copper	8	8½
Auto radiators (unswaged)	5½	6
No. 1 composition	7½	8
No. 1 composition turnings	7½	7¾
Clean red car boxes	6½	6¾
Cocks and faucets	6½	6¾
Mixed heavy yellow brass	5½	5½
Old rolled brass	5½	6
Brass pipe	6½	7
New soft brass clippings	8½	9
Brass rod ends	6½	7
No. 1 brass rod turnings	5½	6

Aluminum

Alum. pistons and struts	3¾	3¾
Aluminum cranks	5	5½
2S aluminum clippings	9	9½
Old sheet and utensils	5	5½
Borings and turnings		3
Misc. cast aluminum	5	5½
Dural clips (24S)	5	5½

Zinc

New zinc clippings	4½	5
Old zinc	3	3½
Zinc routings	2	2½
Old die cast scrap		2

Nickel and Monel

Pure nickel clippings	16	17
Clean nickel turnings	14	15
Nickel anodes	16	17
Nickel rod ends	16	17
New Monel clippings	10½	11½
Clean Monel turnings	6	7
Old sheet Monel	8	9
Old Monel castings	7	8
Inconel clippings	10	11
Nickel silver clippings, mixed	6	7
Nickel silver turnings, mixed	5½	6

Lead

Soft scrap, lead	7	7½
Battery plates (dry)	4½	4½

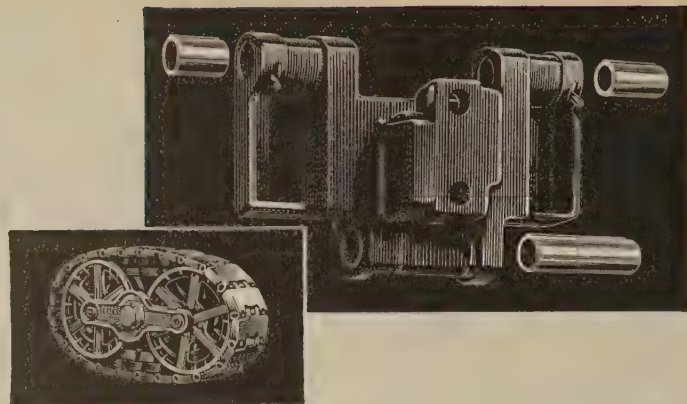
Magnesium Alloys

Segregated solids	9	10
Castings	5½	6½

Miscellaneous

Block tin	70	72
No. 1 pewter	47	49
No. 1 auto babbitt	40	42
Mixed common babbitt	9	9½
Solder joints	10½	11
Siphon tops	45	47
Small foundry type	11½	12
Monotype	9½	10
Lino. and stereotype	9	9½
Electrotype	7	7½
New type shell cuttings	8	8½
Hand picked type shells		4
Lino. and stereo. dross	5	5½
Electro. dross	3½	4

Track Shoes for a Heavyweight



SEE those crawler wheel track shoes on the unit behind the tractor? They carry heavy loads over rock, sand, clay, and gravel — through mud, snow, and water. That means every part has got to be super-tough—particularly the bushings that hinge the shoes together. Imagine the constant twist and strain, pound and jolt — the harsh grinding wear of tiny abrasive earth particles that these bushings must stand.

The Trackson Company, makers of these crawler units, brought this problem to Globe Steel Tubes Co. Globe made specific recommendations for a tough, heat-treated alloy steel tubing in a special self-locking lug shape to make these bushings. Result: the Trackson Company simplified production—bettered their product. If you have a design or a production problem—investigate tubing as a possible answer for minimizing machining, lowering cost, reducing weight, improving product performance. Write — Globe Steel Tubes Co., Milwaukee 11, Wis.

Photo — Courtesy of the Trackson Company, Milwaukee



Globe Seamless Stainless Steel Tubes — Gloweld Welded Stainless Steel Tubes — Globe Mechanical Tubes — Globe-Iron Seamless High Purity Ingot Iron Tubes — Globe Aircraft Tubes — Pressure Tubes — Carbon and Alloy Steel Tubes — Globe Welding Fittings.

GLOBE

STEEL TUBES



Prices Slip Further In Dull Market

New York

••• There was no sign of encouragement in the scrap market during the past week. There is little demand for scrap at any price. Brokers do not anticipate a change in the listless market—at least during the summer months. Business has been off for quite some time now and old orders which are running out have not been renewed.

THE IRON AGE scrap composite dropped another 75¢ per gross ton this week. It is now \$20.92 per gross ton, a new low for the year. This represents a drop of \$22.08 per gross ton since the first of the year. Prices of No. 1 heavy melting steel this week are: Pittsburgh, \$22 to \$23; Chicago, \$20.50 to \$21; and Philadelphia, \$19 to \$20.

All market areas showed signs of weakness which can be attributed to the lack of interest on the part of the consumer. The Philadelphia market showed real bearishness with most of the items on the downside. Chicago and Pittsburgh were also weak with most sales off from the previous week.

Consensus of opinion among brokers is that if some aggressive buying should develop in any one of the large scrap consuming areas, the immediate effect would be higher prices. So far this buying has not developed and brokers feel that it will not do so until August or September. Consumer inventories are large enough at present to be able to sustain them for quite some time if a coal strike should develop.

Some scrap has been moving out of one district into another, but only a carload or two. A carload of machine shop turnings was bought in Rhode Island last week by a Pittsburgh crusher for \$5 a ton. No. 2 heavy melting was bought in the East for \$11 and delivered to Pittsburgh. Some dealers are in need of funds and will sell at these lower prices so that they can stay in business.

•
PITTSBURGH—A small tonnage of No. 1 steel was sold at \$23 a ton early this week but sales on No. 2 steel and No. 2 bundles have dropped quotations for these

grades by 25¢ a ton. Since there is no market for low phos. this material is now being shipped on No. 1 steel orders though brokers have to work on 50¢ commission on this business. Machine shop turnings are holding firm because crushers can't buy enough locally to fill their \$18 Carnegie orders. The reason is a drop in industrial output in the district. Heavy steel forge turnings were off sharply on last week's business. The \$24.50 top on railroad No. 1 steel dropped 50¢ on sales.

•
CHICAGO—Upon appraisal of all factors last week's prices slipped 75¢ a ton on the major items. A few scattered sales were made at the lower figures, however, bonafide offers were plentiful. Shipments at old prices are now practically completed. Railroad specialties were a little erratic as prices fluctuated up and down depending on the item. Many yards are in the doldrums. Employees are being given vacations and not all of them will be called back. They believe that the mills will not do any active buying prior to July 15. Further, the mass vacation periods in many metal fabricating plants point to the fact that July may be the lowest month seen in years by the scrap trade in this area.

•
PHILADELPHIA—There was no new business in the market last week. Brokers were virtually without orders from eastern Pennsylvania mills, the sentiment in the market was bearish because of the news of further shutdowns of district furnaces. Brokers reduced their buying prices for heavy melting grades last week. A railroad list found few bidders last week, but prices bid for Navy Yard scrap were above the current market. The cast market was weak. No. 1 melting is quoted \$1.50 lower, No. 2 \$1 lower and bundles 50¢ lower. Some dealers are beginning to feel the financial effects of the long period without any real orders.

•
CLEVELAND—Trading here is at a very low ebb and after an appraisal of all market factors involved, prices quoted are nominal. With the exception of blast furnace grades, tonnages being traded here is headed for the Valley. At least two major segments of the trade here have been stockpiling for the past 2 weeks in an anticipatory move but prices are probably not yet low enough for general trade speculation. On the other hand, if major consumers should come into the market simultaneously for any important tonnages, present prices would rise immediately. Brokers are getting hold-ups from some Valley consumers. Indications are that July plant lists will provide the acid test. Major consumers here and in the Valley are not likely to buy even limited tonnages before August, according to trade rumors.

•
CINCINNATI—In the absence of any trading of representative tonnages here, scrap, particularly borings and turnings are moving out of the Cincinnati area to

consumers in other districts. Locally, all grades are in easy supply and no demand. Brokers report the volume of business on old paper is very low. Foundries have substantially curtailed operations and are buying a car at a time if at all. Major consumers are taking what tonnage they have orders out on, and there is talk of some resumption of buying during August.

•
DETROIT—The tone of the market here continues on the weak side despite a recent purchase by a local buyer at prices slightly higher than those quoted this week. The most recent buy here was, it is understood, exceptionally high grade industrial material, most of which was purchased by brokers and dealers last month from large automotive producers. Top grade material continues in good demand here, although dealer scrap is generally very little in demand. There has been some activity here in both blast furnace and cast iron grades.

•
NEW YORK—The market is still very dull with demand thinning out. Consumers are not interested in scrap since many have sizable inventories. There has been a steady falling off of business which does not warrant additional purchases at this time. Some dealers have said that it is getting to the point where it is unprofitable to handle any scrap when figuring the higher postwar yard operating costs. The list again was weaker with No. 1 and No. 2 heavy melting off another 50¢. Little demand for the cast grades dropped some of these items up to \$1 on the low side.

•
ST. LOUIS—The market for scrap iron continues quiet in the St. Louis industrial district. The only sales were of distressed cars here and there, and at lower prices. The movement to this market is light, and only such material for which previous commitments have been made. Country dealers complain that prices are too low to interest them.

•
BOSTON—There is very little scrap coming in here. The few sales in No. 1 steel are around \$14 to \$14.25. There are no orders in No. 2 steel, and hardly any trading in other scrap. The cast market is just as stagnant as it has been and yards are taking in very little of this commodity.

•
BIRMINGHAM—It's the same scrap story at Birmingham for another week. The price trend is weaker and activity is slower. The coal mine strike has not affected demand and scarcely any type of material is moving. Mills and foundries have 45-day inventories, at least.

•
BUFFALO—The market here lacks luster. It is dull and then some. Operations keep up in steel plants but interest in scrap buying in large amounts is nil. No. 1 and No. 2 heavy melting are lower this week on appraisal. No. 1 bundles is off on actual sales. The spread on major items is this week \$1.00 a ton to take care of nominal market and bigger broker fees.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$22.00 to \$23.00
R.R. hvy. melting	23.50 to 24.00
No. 2 hvy. melting	19.75 to 20.75
No. 2 bundles	17.75 to 18.75
RR. scrap rails	24.50 to 25.50
Rails 2 ft and under	23.50 to 29.50
No. 1 comp'd bundles	22.00 to 23.00
Hand bld. new shfts.	19.75 to 20.75
Hvy. steel forge turn.	17.50 to 18.00
Mach. shop turn.	14.50 to 15.00
Shoveling turn.	17.50 to 18.00
Mixed bor. and ms. turn.	14.50 to 15.00
Cast iron borings	17.50 to 18.00
No. 1 mach. cast.	26.00 to 27.00
Mixed yard cast.	21.50 to 22.50
Hvy. breakable cast.	20.50 to 21.50
Malleable	24.50 to 25.00
RR. knuck. and coup.	26.00 to 26.50
RR. coil springs	26.00 to 26.50
RR. leaf springs	26.00 to 26.50
Rolled steel wheels	26.00 to 26.50
Low phos.	22.50 to 23.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$20.50 to \$21.00
No. 2 hvy. melting	18.50 to 19.00
Factory bundles	20.50 to 21.00
No. 1 dealers' bundles	17.00 to 18.00
No. 2 dealers' bundles	16.50 to 17.00
Mach. shop turn.	11.00 to 12.00
Short shov. turn.	15.00 to 16.00
Cast iron borings	14.00 to 15.00
Mix. borings and turn.	10.00 to 11.00
Low phos. hvy. forge	24.00 to 24.50
Low phos. plates	23.00 to 23.50
No. 1 RR. hvy. melt.	22.00 to 24.00
Rerolling rails	27.00 to 28.00
Miscellaneous rails	24.00 to 24.50
Angles and splice bars	25.00 to 25.50
Locomotive tires, cut	26.50 to 27.00
Cut bolster & side frames	23.00 to 24.00
Standard stl. car axles	27.00 to 28.00
No. 3 steel wheels	24.00 to 24.50
Couplers and knuckles	25.00 to 25.50
Rails, 2 ft and under	27.00 to 29.00
Malleable	22.00 to 23.00
No. 1 mach. cast.	28.50 to 29.25
No. 1 agricul. cast.	26.00 to 26.50
Heavy breakable cast.	22.50 to 23.50
RR. grate bars	18.00 to 18.50
Cast iron brake shoes	17.50 to 18.00
Cast iron car wheels	27.00 to 29.00

CINCINNATI

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	\$19.00 to \$20.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 bundles	18.00 to 19.00
No. 2 bundles	16.00 to 17.00
Mach. shop turn.	7.00 to 8.00
Shoveling turn.	8.00 to 9.00
Cast iron borings	8.00 to 9.00
Mixed bor. and turn.	8.00 to 9.00
Low phos. 18 in. under	24.00 to 25.00
No. 1 cupola cast.	26.00 to 27.00
Hvy. breakable cast.	18.00 to 19.00
Rails 18 in. and under	29.00 to 30.00
Rails random length	21.00 to 22.00
Drop broken	29.00 to 30.00

BOSTON

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$14.00 to \$14.25
No. 2 hvy. melting	11.25 to 12.00
No. 1 bundles	12.50 to 12.75
No. 2 bundles	10.00 to 11.00
Bushelings	10.00 to 10.50
Shoveling turn.	9.00 to 9.50
Machine shop turn.	5.50 to 6.50
Mixed bor. and turn.	4.75 to 5.25
Cl'n cast chem. bor.	10.00 to 12.00
No. 1 machinery cast.	27.00 to 31.00
No. 2 machinery cast.	21.00 to 23.00
Heavy breakable cast.	17.50 to 18.50
Stove plate	17.00 to 19.00

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	\$15.50 to \$16.00
No. 2 hvy. melting	12.50 to 13.00
No. 1 bundles	15.50 to 16.00
New busheling	15.50 to 16.00
Flashings	15.50 to 16.00
Mach. shop turn.	9.50 to 10.00
Shoveling turn.	10.50 to 11.00
Cast iron borings	10.50 to 11.00
Mixed bor. and turn.	9.50 to 10.00
Low phos. plate	15.50 to 16.00
Heavy breakable cast.	13.50 to 16.50
Stove plate	16.00 to 17.00
Automotive cast.	21.00 to 23.00
No. 1 cupola cast.	19.50 to 21.50

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.00 to \$20.00
No. 2 hvy. melting	17.50 to 18.50
No. 1 bundles	19.00 to 20.00
No. 2 bundles	16.00 to 17.00
Mach. shop turn.	11.50 to 12.50
Shoveling turn.	13.00 to 14.00
Mixed bor. and turn.	10.00 to 11.00
Clean cast chemical bor.	17.00 to 18.00
No. 1 machinery cast.	27.00 to 28.00
No. 1 mixed yard cast.	24.00 to 25.00
Hvy. breakable cast.	24.00 to 25.00
Hvy. axle forge turn.	19.00 to 20.00
Low phos. electric furnace	22.50 to 23.00
Low phos. acid openhearth	21.50 to 22.00
Low phos. bundles	19.00 to 20.00
RR. steel wheels	23.00 to 24.00
RR. coil springs	23.00 to 24.00
RR. malleable	23.00 to 24.00
Cast iron carwheels	27.50 to 28.50

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$18.00 to \$19.00
No. 2 hvy. melting	17.00 to 18.00
No. 2 bundled sheets	15.00 to 16.00
Mach. shop turn.	10.00 to 11.00
Shoveling turnings	10.00 to 11.00
Locomotive tires, uncut	19.00 to 20.00
Mis. std. sec. rails	21.00 to 22.00
Steel angle bars	26.00 to 27.00
Rails 3 ft and under	26.00 to 27.00
RR. steel springs	21.00 to 22.00
Steel car axles	25.00 to 27.00
Brake shoes	21.00 to 22.00
Malleable	22.00 to 23.00
Cast iron car wheels	25.00 to 26.00
No. 1 machinery cast.	23.00 to 25.00
Hvy. breakable cast.	19.00 to 20.00
Stove plate	20.00 to 21.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$18.00
No. 2 hvy. melting	18.00
No. 2 bundles	16.00
No. 1 busheling	18.00
Long turnings	13.00
Shoveling turnings	15.00
Cast iron borings	15.00
Bar crops and plate	22.50
Structural and plate	22.50
No. 1 cupola cast.	26.00
Stove plate	20.00
No. 1 RR. hvy. melt.	\$20.00 to 20.50
Steel axles	20.00 to 20.50
Scrap rails	20.00
Rerolling rails	24.00
Angles & splice bars	22.00 to 23.00
Rails 2 ft & under	23.00 to 24.00
Cast iron carwheels	18.00 to 19.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$21.00 to \$21.50
No. 2 hvy. melting	19.00 to 19.50
No. 1 bundles	21.00 to 21.50
No. 2 bundles	17.50 to 18.00
Mach. shop turn.	11.00 to 11.50
Short shov. turn.	18.00 to 18.50
Cast iron borings	18.00 to 18.50
Low phos.	22.00 to 22.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$13.00 to \$14.00
No. 2 hvy. melting	11.50 to 12.00
No. 2 bundles	10.00 to 11.00
Mach. shop turn.	5.25 to 5.75
Mixed bor. turn.	5.25 to 5.75
Shoveling turnings	7.00 to 8.00
Machinery cast.	20.50 to 21.00
Mixed yard cast.	18.00 to 19.50
Heavy breakable cast.	18.50 to 19.50
Charging box cast.	18.50 to 19.50
Unstrp. motor blks.	14.50 to 15.00
Cl'n cast chem. bor.	11.00 to 13.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.50 to \$20.50
No. 2 hvy. melting	17.50 to 18.50
No. 1 bundles	17.50 to 18.50
No. 2 bundles	15.50 to 16.50
No. 1 busheling	17.50 to 18.50
Mach. shop turn.	11.00 to 11.50
Shoveling turn.	15.00 to 15.50
Cast iron borings	15.00 to 15.50
Mixed bor. and turn.	15.00 to 15.50
Cupola cast.	25.00 to 26.00
Mixed yard cast.	23.00 to 24.00
Stove plate	23.00 to 24.00
Small indus. malleable	19.00 to 20.00
Low phos. plate	21.50 to 22.50
Scrap rails	25.00 to 26.00
Rails 3 ft & under	32.00 to 33.00
RR. steel wheels	25.00 to 26.00
RR. coil & leaf spgs.	25.00 to 26.00
RR. knuckles & coup.	25.00 to 26.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$18.00 to \$19.00
No. 2 hvy. melting	16.00 to 16.50
No. 1 bundles	18.00 to 19.00
No. 2 bundles	15.00 to 15.50
No. 1 busheling	18.00 to 19.00
Drop forge flashings	18.00 to 19.00
Mach. shop turn.	10.00 to 11.00
Shoveling turn.	17.50 to 18.00
Steel axle turn.	18.00 to 19.00
Cast iron borings	17.50 to 18.00
Mixed bor. & turn.	17.50 to 18.00
Low phos. 2 ft and under	20.00 to 21.00
No. 1 mach. cast.	27.00 to 28.00
Malleable	21.00 to 22.00
RR. cast.	27.50 to 28.50
Railroad grate bars	20.00 to 21.00
Stove plate	20.00 to 21.00
RR. hvy. melting	20.00 to 21.00
Rails 3 ft and under	23.00 to 29.00
Rails 18 in. and under	29.00 to 30.00

SAN FRANCISCO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	18.00
No. 1 bales	16.00
No. 2 bales	16.00
No. 3 bales	13.00
Mach. shop turn.	12.00
Elec. fur. 1 ft under	28.00
No. 1 cupola cast.	\$20.00 to 25.00
RR. hvy. melting	20.00
Rails	23.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	18.00
No. 1 bales	16.00
No. 2 bales	16.00
No. 3 bales	13.00
Mach. shop turn.	12.00
Elec. fur. 1 ft under	30.00
No. 1 cupola cast.	\$24.00 to 26.00
RR. hvy. melting	20.00

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	\$20.00
No. 1 & No. 2 bales	16.00
No. 3 bales	13.00
Elec. fur. 1 ft and under	22.00
No. 1 cupola cast.	\$20.00 to 27.00
RR. hvy. melting	20.00

HAMILTON, ONT.

Per gross ton delivered to consumer:

Cast Grades f.o.b. shipping point:	
Heavy melting	\$23.00*
No. 1 bundles	23.00*
No. 2 bundles	22.50*
Mechanical bundles	21.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, rerolling	26.00*
Bushelings	17.50*
Bushelings, new fact, prop'd	21.00*
Bushelings, new fact, unprop'd	16.00*
Short steel turnings	17.00*
No. 1 cast.	\$48.00 to 50.00
No. 2 cast.	44.00 to 45.00

*Ceiling Price.



NEW CANNON FOR OLD

A great need for scrap was manifested after the war of 1812. Condemned cannons were sold to foundries to be scrapped and exchanged for more modern types. At a public auction in 1824—73,000 pounds of scrap iron and surplus cannon were sold at one frontier town.

The government is still a very large source of scrap iron and steel. Luria Brothers & Company, Incorporated, play a vital part in delivering government scrap to mills as it becomes available. Our fifteen strategically located offices are constantly at your service.

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Luria Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices . .

Price advances over previous week are printed in Heavy Type: declines appear in *Italics*.

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	June 14, 1949	June 7, 1949	May 17, 1949	June 15, 1948
(cents per pound)				
Hot-rolled sheets	3.25	3.25	3.25	2.775
Cold-rolled sheets	4.00	4.00	4.00	3.495
Galvanized sheets (10 ga)	4.40	4.40	4.40	3.913
Hot-rolled strip	3.25	3.25	3.25	2.775
Cold-rolled strip	4.038	4.038	4.038	3.535
Plates	3.40	3.40	3.40	2.93
Plates wrought iron	7.85	7.85	7.85	7.25
Stains C-R strip (No. 302)	33.25	33.25	33.25	30.50

Tin and Terneplate:	June 14, 1949	June 7, 1949	May 17, 1949	June 15, 1948
(dollars per base box)				
Tinplate (1.50 lb) cokes	\$7.75	\$7.75	\$7.75	\$6.70
Tinplate, electro (0.50 lb)	6.70	6.70	6.70	5.90
Special coated mfg. ternes	6.65	6.65	6.65	5.80

Bars and Shapes:	June 14, 1949	June 7, 1949	May 17, 1949	June 15, 1948
(cents per pound)				
Merchant bars	3.35	3.35	3.35	2.875
Cold-finished bars	3.995	3.995	3.995	3.483
Alloy bars	3.75	3.75	3.75	3.213
Structural shapes	3.25	3.25	3.25	2.767
Stainless bars (No. 302)	28.50	28.50	28.50	26.00
Wrought iron bars	9.50	9.50	9.50	8.65

Wire:	June 14, 1949	June 7, 1949	May 17, 1949	June 15, 1948
(cents per pound)				
Bright wire	4.15	4.15	4.15	3.608

Rails:	June 14, 1949	June 7, 1949	May 17, 1949	June 15, 1948
(dollars per 100 lb)				
Heavy rails	\$3.20	\$3.20	\$3.20	\$2.725
Light rails	3.55	3.55	3.55	3.05

Semifinished Steel:	June 14, 1949	June 7, 1949	May 17, 1949	June 15, 1948
(dollars per net ton)				
Rerolling billets	\$52.00	\$52.00	\$52.00	\$45.00
Slabs, rerolling	52.00	52.00	52.00	45.00
Forging billets	61.00	61.00	61.00	54.00
Alloy blooms, billets, slabs	63.00	63.00	63.00	66.00

Wire rod and Skelp:	June 14, 1949	June 7, 1949	May 17, 1949	June 15, 1948
(cents per pound)				
Wire rods	3.40	3.40	3.40	3.133
Skelp	3.25	3.25	3.25	2.888

Pig Iron:	June 14, 1949	June 7, 1949	May 17, 1949	June 15, 1948
(per gross ton)				
No. 2, foundry, Phila.	\$50.56	\$50.56	\$50.56	\$44.74
No. 2, Valley furnace	46.50	46.50	46.50	39.50
No. 2, Southern Cin'ti*	45.47	45.47	45.47	45.47
No. 2, Birmingham	39.38	39.38	39.38	39.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	39.00
Basic del'd Philadelphia*	49.74	49.74	49.74	44.24
Basic, Valley furnace	46.00	46.00	46.00	39.00
Malleable, Chicago†	46.50	46.50	46.50	39.50
Malleable, Valley	46.50	46.50	46.50	39.50
Charcoal, Chicago	73.78	73.78	73.78	65.55
Ferromanganese‡	173.40	173.40	173.40	145.00

†The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡Average of U. S. prices quoted on Ferroalloy page.
*Does not include interim increase on total freight charges, effective Jan. 11, 1949.

Scrap	June 14, 1949	June 7, 1949	May 17, 1949	June 15, 1948
(per gross ton)				
Heavy melt'g steel, P'gh.	\$22.50	\$22.50	\$22.75	\$40.25
Heavy melt'g steel, Phila.	19.50	21.00	22.00	42.50
Heavy melt'g steel, Ch'go	20.75	21.50	23.50	39.25
No. 1, hy. comp. sh't, Det.	15.75	15.75	16.75	35.50
Low phos. Young'n.	22.25	23.25	24.75	45.25
No. 1, cast, Pittsburgh	26.50	26.50	27.75	63.75
No. 1, cast, Philadelphia	27.50	28.00	28.00	67.00
No. 1, cast, Chicago	28.88	27.50	28.00	69.50

Coke, Connellsville:	June 14, 1949	June 7, 1949	May 17, 1949	June 15, 1948
(per net ton at oven)				
Furnace coke, prompt	\$14.25	\$14.25	\$14.25	\$12.75
Foundry coke, prompt	16.25	16.25	16.25	14.00

Nonferrous Metals:	June 14, 1949	June 7, 1949	May 17, 1949	June 15, 1948
(cents per pound to large buyers)				
Copper, electro, Conn.	16.50	17.625	18.00	21.50
Copper, Lake Conn.	18.625	18.625	18.625	21.625
Tin, Grade A, New York	\$1.03	\$1.03	\$1.03	\$1.03
Zinc, East St. Louis	9.50	11.00	12.00	12.00
Lead, St. Louis	11.85	11.85	13.85	17.30
Aluminum, virgin	17.00	17.00	17.00	15.00
Nickel, electrolytic	42.93	42.93	42.93	36.56
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	38.50	38.50	38.50	35.00

Starting with the issue of May 12, 1949 the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive, see p. 139 of May 12, 1949 issue. The composite under the old method this week would have been 3.73330¢ per lb.

Composite Prices . .

FINISHED STEEL (Base Price)	June 14, 1949	June 7, 1949	May 17, 1949	June 15, 1948
One week ago	3.705¢ per lb.	3.705¢ per lb.	3.705¢ per lb.	3.211¢ per lb.
One month ago	3.705¢ per lb.	3.705¢ per lb.	3.705¢ per lb.	3.211¢ per lb.
One year ago	3.211¢ per lb.	3.211¢ per lb.	3.211¢ per lb.	3.211¢ per lb.

HIGH	LOW
1949.... 3.720¢ Jan. 1	3.705¢ May 3
1948.... 3.721¢ July 27	3.193¢ Jan. 1
1947.... 3.193¢ July 29	2.848¢ Jan. 1
1946.... 2.848¢ Dec. 31	2.464¢ Jan. 1
1945.... 2.464¢ May 29	2.396¢ Jan. 1
1944.... 2.396¢	2.396¢
1943.... 2.396¢	2.396¢
1942.... 2.396¢	2.396¢
1941.... 2.396¢	2.396¢
1940.... 2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939.... 2.35367¢ Jan. 3	2.26689¢ May 16
1938.... 2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937.... 2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936.... 2.32263¢ Dec. 28	2.05200¢ Mar. 10
1935.... 2.07642¢ Oct. 1	2.06492¢ Jan. 8
1934.... 2.15367¢ Apr. 24	1.95757¢ Jan. 2
1933.... 1.95578¢ Oct. 3	1.75836¢ May 2
1932.... 1.89196¢ July 5	1.83901¢ Mar. 1
1931.... 1.99626¢ Jan. 13	1.86586¢ Dec. 29
1929.... 2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

PIG IRON	SCRAP STEEL
....\$45.91 per gross ton....	\$20.92 per gross ton....
....\$45.91 per gross ton....	\$21.67 per gross ton....
....\$45.91 per gross ton....	\$22.75 per gross ton....
....\$40.51 per gross ton....	\$40.66 per gross ton....

HIGH	LOW	HIGH	LOW
\$46.82 Jan. 4	\$45.91 May 10	\$43.00 Jan. 1	\$20.92 June 14
46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 23	29.50 May 20
30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
\$23.61	\$23.61	19.17 Jan. 11	15.76 Oct. 24
23.61	23.61	\$19.17	\$19.17
23.61	23.61	19.17	19.17
\$23.61 Mar. 20	\$23.45 Jan. 2	\$22.00 Jan. 7	\$19.17 Apr. 10
23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

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Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Widths up to 12-in. inclusive. (2) 0.25 carbon and less. (3) Cokes, 1.25 lb, deduct 25¢ per base box. (4) 18 gage and heavier. (5) For straight length material only from producers to fabricators. (6) Also shafting. For quantities of 40,000 lb and over. (7) Carload lot in manufacturing trade. (8) Hollowware enameling, gages 29 to 31 only. (9) Produced to dimensional tolerances in AISI Manual Sec. 6. (10) Slab prices subject to negotiation in most cases. (11) San Francisco only. (12) Los Angeles only. (13) San Francisco and Los Angeles only. (14) Seattle only. (15) Seattle and Los Angeles only.

PRODUCTS	Base prices at producing points apply to the sizes and grades produced in these areas															
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Young- town	Spar- rows Point	Granite City	Middle- town, Ohio			Detroit	Johns- town	Seattle, S. Frisco, Los Angeles	Fontana
INGOTS Carbon forging	\$50.00												\$50.00			
Alloy	\$51.00						(per net ton)						\$51.00			
BILLETS, BLOOMS, SLABS Carbon, rerolling ¹⁰	\$52.00				\$52.00	\$52.00	(per net ton)							\$52.00		\$71.00
Carbon forging billets	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	(per net ton)						\$61.00	\$61.00		\$80.00
Alloy	\$63.00	\$63.00				\$63.00	(Bethlehem, Canton, Massillon = \$63.00) (per net ton)						\$63.00			\$82.00
PIPE SKELP	3.25						3.25					Warren = 3.25				
WIRE RODS	3.40	3.40		3.40	3.40		3.40	3.50				Worcester 3.70		3.40	4.05 ¹¹ 4.20 ¹²	
SHEETS Hot-rolled ⁴	3.25	3.25	3.25	3.25	3.25	3.25 (Consho	3.25 hocken,	3.25 Pa. 3.35)			Warren, Ashland = 3.25		3.45		3.95 ¹³	4.15
Cold-rolled	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	Warren 4.00		4.20		Pittsburg, Cal. 4.95	4.90
Galvanized (10 gage)	4.40	4.40	4.40		4.40			4.40	Canton = 4.40	4.40	Ashland = 4.40				5.15 ¹³	
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40			4.70			
Long ternes (10 gage)	4.80		4.80							4.80						
STRIP Hot-rolled ¹	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25		3.25	Warren = 3.25		3.45		4.00 to 4.25	4.40
Cold-rolled ²	4.00	4.15		4.00		4.00	4.00	4.00			New Haven 4.50 Warren = 4.00 to 4.25		4.20 to 4.25			4.80
TINPLATE Cokes, 1.50 lb. ³ base box	\$7.75	\$7.75	\$7.75		\$7.85			\$7.85	\$7.95		Warren, Ohio = \$7.75				Pittsburg, Cal. = \$8.50	
Electrolytic 0.25, 0.50, 0.75 lb. box	Deduct \$1.30, \$1.05 and 75¢ respectively from 1.50 lb. coke base box price															
TERNES MFG., special coated	Deduct \$1.10 from 1.50 lb. coke base box price															
BLACKPLATE CANMAKING 55 to 128 lb.	Deduct \$2.00 from 1.50 lb. coke base box price															
BLACKPLATE, h.e., 29 ga. ⁸	5.30	5.30	5.30					5.40			Warren, Ohio = 5.30					
BARS Carbon Steel	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton = 3.35		3.55	3.35	4.05	4.00
Reinforcing (billet) ⁵	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton = 3.35			3.35	4.05 to 4.10	4.00
Cold-finished ⁶	3.95 to 4.00	4.00	4.00	4.00		4.00	4.00						4.30			
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75		Bethlehem, Canton, Massillon = 3.75				4.05	3.75	4.80 ¹²	4.75
Alloy cold-drawn	4.65	4.65	4.65	4.65		4.65	4.65		Massillon = 4.65		Worcester 4.95					
PLATE Carbon steel ⁹	3.40	3.40	3.40	3.40	3.40 Cons	3.40 hocken	3.40 = 3.50	3.40	3.40 Coatesville = 3.50, Claymont = 3.50 Geneva = 3.40, Harrisburg = 3.50				3.65	3.40	4.30 ¹⁴	4.00
Floor plate _p	4.55	4.55		4.55					Conshohecken = 4.55							
Alloy	4.40	4.40							Coatesville = 4.50							
SHAPES, Structural	3.25	3.25	3.25		3.25	3.30			Bethlehem = 3.30, Geneva, Utah = 3.25					3.30	3.80 to 3.90 ¹⁴	3.80
MANUFACTURERS' WIRE ⁷ Bright	4.15	4.15		4.15	4.15		4.15	4.25	Duluth = 4.15, Worcester = 4.45					4.15	5.15 ¹¹	
Spring (high carbon)	5.20	5.20		5.20				5.30	Worcester = 5.50 New Haven, Trenton = 5.50					5.20	Duluth = 5.20-6.15	
PILING, Steel sheet	4.05	4.05				4.05										

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	Chromium Nickel							Straight Chromium		
	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling.....	12.75	13.50	15.00	15.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling....	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.00	18.50	15.25
Forg. discs, die blocks, rings.	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging.....	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals.....	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates.....	32.00	32.00	34.80	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets.....	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled.....	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled.....	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

ELECTRODES

Cents per lb. f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
Carbon		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	90.5¢
18	4	1	—	5	\$1.42
18	4	2	—	—	\$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢

High-carbon-chromium 52¢
Oil hardened manganese 29¢
Special carbon 26.5¢
Extra carbon 22¢
Regular carbon 19¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

ELECTRICAL SHEETS

24 gage, HR cut lengths, f.o.b. mill

Cents per lb

Armature	5.45
Electrical	5.95
Motor	6.70
Dynamo	7.50
Transformer 72	8.05
Transformer 65	8.60
Transformer 58	9.30
Transformer 52	10.10

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	\$3.20†
Joint bars, 100 lb	4.25
Light rails (from billets) per 100 lb	3.55

Base Price
cents per lb

Track spikes	5.35
Axles	5.20
Screw spikes	8.00
Tie plates	4.05
Tie plates, Pittsburg, Calif.*	4.20
Track bolts, untreated	8.25
Track bolts, heat treated, to rail- roads	8.50

*Seattle, add 30¢

†CF&I, \$3.30.

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.00¢
0.41 to 0.60 carbon	5.50¢
0.61 to 0.80 carbon	6.10¢
0.81 to 1.05 carbon	8.05¢
1.06 to 1.35 carbon	10.35¢

Worcester, add 0.30¢.

CLAD STEEL

Base prices, cents per pound

Stainless clad	Plate	Sheet
No. 304, 20 pct. f.o.b. Coatesville, Pa.	*26.50	
Washington, Pa.	*26.50	*22.50
Claymont, Del.	*26.50	
Conshohocken, Pa.		*22.50
Nickel-clad		
10 pct f.o.b. Coatesville, Pa.		27.50
Inconel-clad		
10 pct, f.o.b. Coatesville.		36.00
Monel-clad		
10 pct, f.o.b. Coatesville.		29.00
Aluminized steel sheets		
Hot dip, f.o.b. Butler, Pa.		7.75

*Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

Base Column
Pittsburg,
Calif.

Standard & coated nails* 103	123
Galvanized nails*	103
Woven wire fence†	109
Fence posts, carloads†† ..	114
Single loop bale ties	106
Galvanized barbed wire** 123	143
Twisted barbless wire ..	123

* Pgh., Chi., Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth only.

Base per Pittsburg,
100 lb Calif.

Annealed fence wire† ...	\$4.80	\$5.75
Annealed, galv. fencing†	5.25	6.20
Cut nails, carloads†† ...	6.75	...

† Add 30¢ at Worcester; 10¢ at Sparrows Pt.

†† Less 20¢ to jobbers.

HIGH STRENGTH, LOW ALLOY STEELS

Mill base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dyn-alloy	Hi Steel	Mayari R	Otis-cloy	Yoloy	MAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic Sharon*	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Sharon*
Plates.....	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.45
Sheets									
Hot-rolled....	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	5.15
Cold-rolled....	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.25
Galvanized....		6.75				6.75			
Strip									
Hot-rolled....	4.95	4.95	4.95		4.95	4.95	4.95	4.95	5.15
Cold-rolled....			6.05			6.05	6.05	6.05	6.25
Shapes.....		4.95			4.95	5.05	4.95	4.95	
Beams.....		4.95							
Bars									
Hot-rolled....	5.10	5.10	5.10		5.10	5.10	5.10	5.10	5.30
Bar shapes.....		5.10			5.10	5.10	5.10	5.10	

* Sheets and strip.

PIPE AND TUBING

Base discounts, f.o.b. mills,
Base price, \$200.00 per net ton.

STANDARD, THREADED AND
COUPLED

Steel, butt weld	Black	Galv.
½-in.	43 to 41	26½ to 24½
¾-in.	46 to 44	30½ to 28½
1-in.	48½ to 46½	33½ to 31½
1¼-in.	49 to 47	34 to 32
1½-in.	49½ to 47½	34½ to 32½
2-in.	50 to 48	35 to 33
2½ to 3-in.	50½ to 48½	35½ to 33½

Steel, lap weld		
2-in.	39½	26 to 24
2½ to 3-in.	43½ to 42½	28 to 27
3½ to 6-in.	46½ to 42½	31 to 27

Steel, seamless		
2-in.	38½ to 27	23 to 11½
2½ to 3-in.	41½ to 32½	26 to 17
3½ to 6-in.	43½ to 38½	28 to 23

Wrought Iron, butt weld		
½-in.	+20½	+47
¾-in.	+10½	+36
1 to 1½ in.	+4½	+27
2-in.	+1½	+23½
3-in.	+2	+23

Wrought Iron, lap weld		
2-in.	+7½	+31
2½ to 3½-in.	+5	+26½
4-in.	+2 list	+20½
4½ to 8-in.	+2	+22

EXTRA STRONG, PLAIN ENDS

Steel, butt weld		
½-in.	42 to 40	27 to 25
¾-in.	46 to 44	31 to 29
1-in.	48 to 46	34 to 32
1¼-in.	48½ to 46½	34½ to 32½
1½-in.	49 to 47	35 to 33
2-in.	49½ to 47½	35½ to 34½
2½ to 3-in.	50 to 48	36 to 34

Steel, lap weld		
2-in.	39½ to 38½	25 to 24
2½ to 3-in.	44½ to 42½	30 to 28
3½ to 6-in.	48 to 44	33½ to 31½

Steel, seamless		
2-in.	37½ to 32½	23 to 18
2½ to 3-in.	41½ to 36½	27 to 23
3½ to 6-in.	45 to 40	30½

Wrought Iron, butt weld		
½-in.	+16	+40
¾-in.	+9½	+34
1 to 2-in.	+1½	+23

Wrought Iron, lap weld		
2-in.	+4½	+27½
2½ to 4-in.	+5	+16
4½ to 6-in.	+1	+20½

For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3½-in. and larger four points higher discount (lower price) applies. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut length 4 to 24 ft inclusive.

Carload lot, cut length 4 to 24 ft inclusive.					
OD Gage		Seamless		Electric Weld	
in.	BWG	H.R.	C.R.	H.R.	C.D.
2	13	\$19.18	\$22.56	\$18.60	\$21.89
2½	12	25.79	30.33	25.02	29.41
3	12	28.68	33.76	27.82	32.74
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago	\$95.70
6 to 24-in., del'd N. Y.	\$92.50 to 97.40
6 to 24-in., Birmingham	82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	109.30
Class "A" and gas pipe, \$5 extra: 4-in. pipe is \$5 a ton above 6-in.	

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Pot Off List
½ in. & smaller x 6 in. & shorter	35
9/16 & 5/8 in. x 6 in. & shorter	37
¾ in. & larger x 6 in. shorter	34
¾ in. & larger than 6 in.	30
All diam., longer over 6 in. longer	35
Lag, all diam x 6 in. & shorter	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)	
½ in. and smaller	35
9/16 to 1 in. inclusive	34
1½ to 1½ in. inclusive	32
1½ in. and larger	27
On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.	

Semifinished Hexagon Nuts

	USS	SAE
7/16 in. and smaller	38	41
½ in. and smaller	38	39
½ in. through 1 in.	37	37
9/16 in. through 1 in.	35	37
1½ in. through 1½ in.	28	
1½ in. and larger		
In full case lots, 15 pct additional discount.		

Stove Bolts

Packages, nuts separate	\$61.75
In bulk	70.00

Large Rivets

	(½ in. and larger)
	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

	(7/16 in. and smaller)
	Pct off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws

	Pct Off List
(In packages)	
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	46
¾ to 1 in. x 6 in., SAE (1035), heat treated	35
Milled studs	19
Flat head cap screws, listed sizes	5
Fillister head cap, listed sizes	28

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill.

	Base price per net ton
Effective CaF ₂ Content:	
70% or more	\$37.00
60% or less	34.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per gross Ton
Old range, bessemer	\$7.60
Old range, nonbessemer	7.45
Mesabi, bessemer	7.45
Mesabi, nonbessemer	7.20
High phosphorus	7.20
After Dec. 31, 1948, increases or decreases in Upper Lake freight, dock and handling charges and taxes thereon to be for the buyers' account.	

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f.	7.9¢ to 9.0¢
New York, ocean bags...	
Domestic sponge iron, 98+%	9.0¢ to 15.0¢
Fe, carload lots	
Electrolytic iron, annealed, 99.5+%	31.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+%	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+%	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 99.8+%	90.0¢ to \$1.75
Aluminum	30.00 to 31.00¢
Antimony	51.17¢
Brass, 10 ton lots	22.75 to 25.75¢
Copper, electrolytic	28.125¢
Copper, reduced	27.75¢
Cadmium	\$2.40
Chromium, electrolytic, 99% min.	\$3.50
Lead	20.22¢
Manganese	55.00 to 60.00¢
Molybdenum, 99%	\$2.65
Nickel, unannealed	66.00¢
Nickel, spherical, minus 30 mesh, unannealed	68.00¢
Silicon	34.00¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.00¢
Tin	\$1.25
Tungsten, 99%	\$2.90
Zinc, 10 ton lots	14.75 to 16.25¢

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	\$14.00 to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.00 to \$16.50
Foundry, oven coke	
Buffalo, del'd	\$22.95
Chicago, f.o.b.	20.40
Detroit, f.o.b.	19.40
New England, del'd	22.70
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	20.45
Swedeland, Pa., f.o.b.	20.40
Plainesville, Ohio, f.o.b.	20.90
Erie, del'd	23.50
Cleveland, del'd	22.45
Cincinnati, del'd	21.50
St. Paul, f.o.b.	23.50
St. Louis, del'd	20.98
Birmingham, del'd	18.66

REFRACTORIES

(F.o.b. Works)

	Carloads, Per 1000
Fire Clay Brick	
First quality, Pa., Ky., Mo., Ill. (except Salina, Pa., add \$5)	\$80.00
No. 1 Ohio	74.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	11.50
Silica Brick	
Mt. Union, Pa., Ensley, Ala.	\$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.	95.00
Super Duty, Hays, Pa., Athens, Tex.	\$85.00 to 95.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	\$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	\$14.75 to 15.00
Silica cement, net ton, bulk, Utah and Calif.	21.00

	Per Net Ton
Chrome Brick	
Standard chemically bonded, Balt., Chester	\$69.00

Magnesite Brick	
Standard, Balt. and Chester	\$91.00
Chemically bonded, Balt. and Chester	80.00

Grain Magnesite	
Std. %-in. grains	
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed	\$56.00 to 56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	\$30.50 to 31.00
in sacks with fines	35.00 to 35.50

Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk, Midwest, add 10¢: Missouri Valley, add 20¢	\$12.25

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 15¢ to base price except Cincinnati and New Orleans (*), add 10¢; New York, add 20¢.)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4815 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4815 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore.....	5.31	6.21-6.41	6.95-7.11	5.37	....	5.56	5.36	5.42	6.18	....	9.60-10.10	....	....
Birmingham.....	5.00	....	6.40	5.00	....	5.15	5.00	5.10	6.57	....	....	....	....
Boston.....	5.55	6.45-6.75	7.11-7.61	5.60-5.95	6.75	5.80	5.42	5.52	6.27	9.67-9.79	10.04-10.07	11.23	11.47
Buffalo.....	4.85	5.75	7.43-7.57	5.30	7.27	5.35	5.10	5.05-5.15	5.90	9.60-9.70	9.85-9.95	11.15	11.40-11.45
Chicago.....	4.85	5.75	6.95-7.10	4.85	5.55-6.88	5.10	4.90	4.90	5.70	8.90	9.26	10.25	10.55
Cincinnati*.....	5.16-5.51	5.84-6.28	6.59-6.93	5.28-5.43	....	5.53-5.85	5.33	5.33-5.48	6.08-6.20	9.74	9.99	11.19	11.44
Cleveland.....	4.85-5.16	5.75-6.06	6.15-7.46	5.03-5.15	....	5.21-5.54	5.01-5.47	5.01-5.34	5.70-5.87	9.49-9.50	9.74-9.75	10.95	11.19-11.20
Detroit.....	5.28-5.32	6.07-6.18	7.38-7.58	5.27-5.47	6.27-6.58	5.52-5.57	5.33-5.40	5.33-5.55	6.00-6.10	9.67	9.92	11.11	11.35
Houston.....	6.70-6.95	....	7.30	6.70	....	6.70	6.20-6.70	6.40-6.65	7.60	10.45	10.40	11.45	11.70
Indianapolis.....	5.29	6.13	7.44	5.29	7.36	5.54	5.34	5.34	6.14	11.25	11.39	....	....
Los Angeles.....	6.45	7.80 ¹⁹ -7.90 ¹	8.05	6.65	8.35 ⁵	6.15	5.95	6.10	7.95 ¹⁴	10.95 ¹⁵	10.90 ¹⁵ -14.70	12.45 ¹⁵	12.70 ¹⁵ -16.45
Memphis.....	5.75-5.80	6.60	7.20	5.80-5.95	6.80	5.95-6.00	5.75	5.75	6.53	....	....	....	....
Milwaukee.....	5.03	5.93	7.13-7.18	5.03-5.38	6.86	5.28	5.08	5.08	5.88	9.53	9.78	10.98	11.23
New Orleans*.....	5.95	6.75	....	6.15	....	6.15	5.95	5.95	6.65 ⁶	....	....	....	....
New York.....	5.40	6.31-6.46	6.90-7.00	5.62-5.72	....	5.70	5.33	5.57	6.36-6.41	9.28-9.73	9.58-9.88	11.18	11.43
Norfolk.....	6.00	....	....	6.20	....	6.05	6.05	6.05	7.05	....	....	....	....
Omaha.....	6.13	....	8.33	6.13	....	6.38	6.18	6.18	6.98	....	....	....	....
Philadelphia.....	5.08	6.24 ¹³	6.73	5.45	6.69	5.38	5.10	5.40	6.19	9.70	9.75	10.95	11.20
Pittsburgh.....	4.85	5.75 ¹	6.90	5.00	6.00	5.05	4.90	4.90	5.65	8.90	9.20	10.25	10.55
Portland.....	6.50 ⁸ -6.90	8.00 ¹	8.80-9.10	6.85 ⁸	....	6.30 ⁸	6.35 ⁸	6.35 ⁸	8.25 ¹⁴	10.50 ⁶	10.10 ⁶	....	....
Salt Lake City.....	7.25 ³	8.20	8.80-9.30	7.65 ³	....	6.10 ³	5.70 ³	6.95 ⁸	8.30	....	....	....	....
San Francisco.....	6.15 ⁸ -7.15	7.50 ²	7.90	6.75 ⁸	8.25 ⁵	6.30-6.35 ⁸	5.90 ⁸	5.90 ⁸	7.55	10.90 ¹⁵	10.85 ¹⁵	12.40 ¹⁵	12.65 ¹⁵
Seattle.....	6.70 ⁴ -7.10	8.15 ² -8.65	8.80-9.30	6.70 ⁴	....	6.35 ⁴	6.30 ⁴	6.20 ⁴	8.15 ¹⁴	....	10.35 ¹⁵	....	13.10 ¹⁵
St. Louis.....	5.22-5.37	6.12 ¹ -6.27	7.32	5.22	6.68-7.54	5.47	5.27	5.27	6.07-6.22	9.27-9.72	9.57-9.97	10.62-11.17	10.92-11.42
St. Paul.....	5.44	6.19-6.34	7.54-7.64	5.44	6.82	5.64-6.69	5.49	5.49	6.29	9.49	9.79	10.84	11.14

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED:

Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED:

Sheets, 400 to 1499 lb strip, extras on all quantities bars 1000 lb and over.

ALLOY BARS:

1000 to 1999 lb.

GALVANIZED SHEETS:

450 to 1499 lb.

EXCEPTIONS:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb; (18) 1000 to 1499 lb; (19) 1500 to 3499 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight nor the 6 pct increase on total freight charges in the Eastern Zone (5 pct Southern Zone, 4 pct Western Zone), effective Jan. 11, 1949.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem.....	48.00	....	....	....	....
Birmingham.....	38.88	39.38	....	....	....
Buffalo.....	46.00	46.50	47.00	....	....
Chicago.....	46.00	46.50	46.50	47.00	....
Cleveland.....	46.00	46.50	46.50	47.00	51.00
Duluth.....	46.00	46.50	46.50	47.00	....
Erie.....	46.00	46.50	46.50	47.00	....
Everett.....	....	52.50	53.00	....	....
Granite City.....	47.90	48.40	48.90	....	....
Ironton, Utah.....	46.00	46.50	....	....	....
Lone Star, Texas.....	46.00	46.50 [†]			
Neville Island.....	46.00	46.50	46.50	....	....
Geneva, Utah.....	46.00	46.50	....	....	....
Sharpsville.....	46.00	46.50	46.50	47.00	....
Steeltown.....	48.00	48.50	49.00	49.50	54.00
Struthers, Ohio.....	46.00	....	....	....	....
Swedeland.....	48.00	48.50	49.00	49.50	....
Toledo.....	46.00	46.50	46.50	47.00	....
Troy, N. Y.....	48.00	48.50	49.00	....	54.00
Youngstown.....	46.00	46.50	46.50	....	....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston.....	Everett.....	\$0.50 Arb.	....	52.50	53.00	....	....
Boston.....	Steeltown.....	6.27	54.27	54.77	55.27	55.77	60.27
Brooklyn.....	Steeltown.....	5.48	....	53.98	54.48	54.98	59.48
Cincinnati.....	Birmingham.....	6.09	44.97	45.47	....	....	....
Jersey City.....	Steeltown.....	3.67	....	52.17	52.67	53.17	57.67
Los Angeles.....	Geneva-Ironton.....	7.13	53.13	53.63	....	....	....
Mansfield.....	Cleveland-Toledo.....	3.03	49.03	49.53	49.53	50.03	54.03
Philadelphia.....	Bethlehem.....	2.17	50.17	....	....	....	....
Philadelphia.....	Swedeland.....	1.31	49.31	49.81	50.31	50.81	....
Philadelphia.....	Steeltown.....	2.81	50.81	51.31	51.81	52.31	56.81
San Francisco.....	Geneva-Ironton.....	7.13	53.13	53.63	....	....	....
Seattle.....	Geneva-Ironton.....	7.13	53.13	53.63	....	....	....
St. Louis.....	Granite City.....	0.75 Arb.	48.65	49.15	49.65	....	....
Gulf Ports.....	Lone Star, Texas.....	....	50.50	51.00 [†]			

[†] Low Phos., Southern Grade.

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess

of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio—\$59.50; f.o.b. Buffalo, \$60.75. Add \$1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50¢ per ton for each 0.50 pct

Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$66.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, \$73.78. High phosphorus charcoal pig iron is not being produced.

FERROALLOY PRICES

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size.	
F.o.b. Birmingham	\$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	\$172
F.o.b. Johnstown, Pa.	\$174
F.o.b. Sheridan, Pa.	\$172
F.o.b. Etna, Pa.	\$175
\$2.00 for each 1% above 82% Mn, penalty, \$2.15 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn	19-21% Mn
3% max. Si	3% max. Si
Palmerton, Pa.	\$64.00
Pgh. or Chicago	\$65.00
	\$66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.	
Carloads Ton Less	
0.07% max. C, 0.06% P, 90% Mn	25.25 27.10 28.30
0.10% max. C	24.75 26.60 27.80
0.15% max. C	24.25 26.10 27.30
0.30% max. C	23.75 25.60 26.80
0.50% max. C	23.25 25.10 26.30
0.75% max. C	
7.00% max. Si	20.25 22.10 23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.	
Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90
Less ton lots	12.80

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, \$80.00; \$78.50 f.o.b. Niagara Falls; Electric furnace silvery iron is not being produced at Jackson. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.	
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Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.	
Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.	
25% Si	13.50
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.	
Cast Turnings Distilled	
Ton lots	\$2.05 \$2.95 \$3.75
Less ton lots	2.40 3.30 4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si)	
0.06% C	23.75
0.10% C	23.25
0.15% C	23.00
0.20% C	22.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35
Briquets—Contract price, cents per pound of briquet, delivered, 60% chromium.	
Carload bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.	
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S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.	
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, cents per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.	
0.20% max. C	1.09
0.50% max. C	1.05
9.00% min. C	1.04

Calcium—Silicon

Contract price per lb of alloy, lump, delivered.	
30-33% Ca, 60-65% Si, 3.00% max. Fe.	
Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.	
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.	
Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.	
Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.	
Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. SI 48 to 52%, TI 9 to 11% Ca 5 to 7%.	
Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.	
Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	\$2.25
Ferrovandium, 35-55%, contract basis, delivered, per pound, contained, V.	
Openhearth	\$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V ₂ O ₅ contract basis, per pound contained V ₂ O ₅	\$1.20
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.	
Ton lots	\$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.10
Calcium molybdate, 45-50%, f.o.b. Langeloth, Pa., per pound contained Mo.	96¢
Molybdenum oxide briquets, f.o.b. Langeloth, Pa.; bags, f.o.b. Wash., Pa., per pound contained Mo.	95¢
Ferrotitanium, 40%, regular grade, 10% C max., f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	\$1.28
Ferrotitanium, 25%, low carbon, f.o.b. Niagara Falls, N.Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	\$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads per net ton	\$160.00
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per pound of alloy.	
Carload, bulk	6.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.40¢
Ton lots	8.80¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk	11.00¢
Ton lots, packed	11.25¢
Less ton lots	11.75¢
Boron Agents	
Contract prices per lb. of alloy, del. Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lot	\$1.20
F.o.b. Wash., Pa.; 100 lb and over	
10 to 14% B.	.75
14 to 19% B.	1.20
19% min. B.	1.50
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	\$1.67
Less ton lots	1.79
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	\$1.80
Silcaz, contract basis, delivered	
Ton lots	45.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Borasil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	\$6.25

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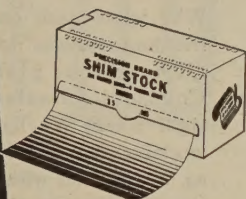
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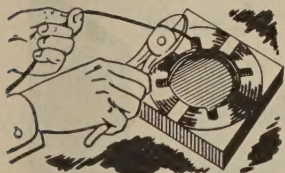


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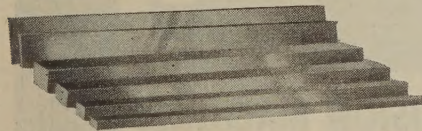
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**Charges Price-Fixing In
Building Materials Field**

Washington

• • • Charging price-fixing in the building materials field, the Dept. of Justice has filed an anti-trust suit in the Cleveland Federal Court against 14 dealers and one individual.

Government charges prices are unlawfully fixed and maintained on approximately 90 hard goods items through "use by agreement among the defendants of a price list" published and distributed by Harry A. DuBroy.

The suit asks the court to enjoin the publication and use of the list and to prohibit any other device which might "result in price stabilization."

In addition to DuBroy, defendants named in the complaint are:

Goff-Kirby Co.; Clifton Coal & Supply Co.; Collinwood Shale Brick & Supply Co.; Zone Coal & Supply Co.; St. Clair Coal & Supply Co.; Geist Coal & Supply Co.; Ideal Builders Supply & Fuel Co.; Queisser Builders Supply Co., Inc.; South Euclid Concrete Co.; Mayfield Builders Supply Co.; City Material & Coal, Inc.; Pacific Builders Supply Co.; Cuyahoga-Dunham Supply Co.; and Breckling Coal & Supply Co., all of Cleveland.

McKee Reports Dividend

Cleveland

• • • Directors of Arthur G. McKee & Co. declared a dividend of 75¢ per share on the Class B stock of the company June 7; payable July 1 to stock of record June 20. Including this dividend, dividends total \$2.25 to date in 1949, as two previous dividend payments of 75¢ each were paid on Jan. 3 and Apr. 1. The next meeting of the directors for consideration of dividend payments will be held early in September.

The company reports that it is making good progress on the large backlog of petroleum refining and iron and steel plant contract work it had in process at the beginning of this year.

While the number of inquiries for new work has been fewer this year than last year because of the decline in expenditures for plant expansion and modernization, the company reports that its dollar volume of new work so far in 1949 is approximately the same as that for the corresponding period in 1948.

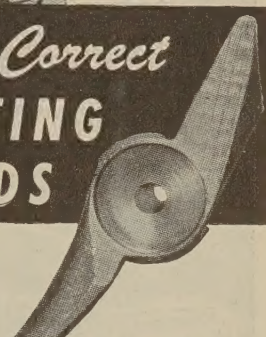
New work for the company in 1949 includes a catalytic cracking plant and several iron ore beneficiation plants.

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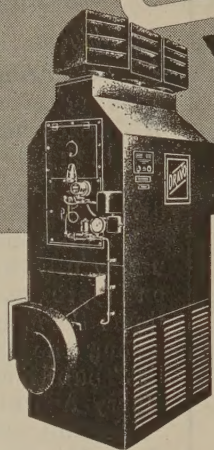
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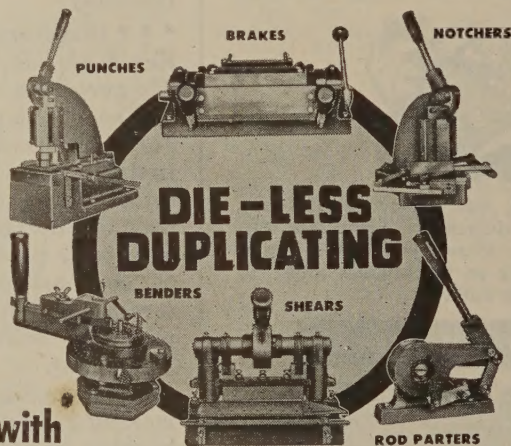
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